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NEWS DIGEST

Damestic

North American Aviation will begin laying off approximately 1,100 employes at its Columbus factory this week, a workforce cutback caused by the government's scheduled stretchouts of defense contracts NAA says approximately 800 production and maintenance workers will be idled Jan 11, with 300 salaried and hourly-wage employes scheduled for lay off "as soon as current studies of new schedules are completed"

Hydrogen bomb will be dropped from a B-36 next May at the Eniwetok Bikini testing grounds, according to unconfirmed reports from the Pentagon Observers believe the test is aimed primarily at determining whether Convair's beefed up bomb carrier (Aviation Week Dec 28, p 11) and its crew can survive the blast

CAB examiner Herbert K Bryan has recommended that Seaboard & Western Airlines get a scheduled non subsidy trans-Atlantic airfreight certificate Approval by President Eisenhower and CAB is required

New $60,000 mechanized final assembly line is cutting more than 3,000 manhours per month off T-33 production time at Lockheed Aircraft Corp's Van Nuys, Calif., plant The operation makes use of a continuously moving line, takes the place of Lockheed's former step-by-step system

Production roadable aircraft has rolled off the assembly line at Molt Taylor's Aerocar plant at Longview Wash

New labor contract has been signed by Capital Airlines with Air Line Pilots Assn granting monthly wage increases ranging from $25 to $60 for pilots and co-pilots Termination date of the agreement Jan 1, 1955

Lightplane shipments totaled 247 aircraft valued at $2,539,000 during November increasing domestic deliveries for the first 11 months of 1953 to 3,564 units at $31,858,000, according to Aircraft Industries Assn Companies reporting shipments Aero Design Beech Cessna, Mooney, Piper and Taylorcraft

Air Materiel Command reports small business contracts totaled $108 million during the first five months of fiscal 1954 a 35% increase over the same period last year USAF says that of the 4,000 plants producing for the Air Force, two thirds are owned and operated by independent small concerns employing 500 persons or less

Record Breaker Gets Welcome

Air National Guard Col. Willard W Millikan brings his North American F-86F Sabre jet fighter to a halt at Mitchel AFB, N Y, after flying from Los Angeles in 4 hr 5 mnn 5 sec on Jan. 2 The ANG pilot encountered unfavorable weather en route, but still managed to break the previous cross-country jet record set Jan 26, 1946 by USAF Col William Connell who made the hop in 4 hr 13 mnn in a Lockheed F-80A Millikan's Sabre was fully armed. He left L. A. with a full fuel load of 850 gal., landed at Omaha and took on 801 gal His tanks went dry soon after he crossed the finish line at Floyd Bennett NAS, N. Y., and he glided in to nearby Idlewild Airport to refuel before going to Mitchel. Later Millikan set a new unofficial speed mark of 24 mnn. from Mitchel AFB to Andrews AFB, Md breaking a 29 mnn record set in April 1946 by Capt M L Smith in an F-80A Millikan had been instructed by USAF not to attempt a record between the two cities because of an AF ban on publicizing speed runs (Aviation Week Jan 4, p 12)

Financial

Glenn L. Martin Co's president, George M Bunker, and vice president, J. B. Wharton, Jr., have acquired 217,152 common shares or approximately 10% of the Baltimore aircraft builder's stockholder through Wealden Co., holding firm of which they are principle stockholders

International

Albert Plesman, founder and president of KLM Royal Dutch Airlines died Dec 31 in The Hague the Netherlands He was 64 (See p 98)

Louis Christiaens, French secretary of state for air and amateur aviation enthusiast, has ridden in an S.O 4050 Vautour during a dive that reached approximately Mach 1 3 becoming the world's first cabinet minister to fly faster than sound

Hurel Dubois H.D 32, twin-engine transport with a high aspect ratio wing (Aviation Week Jan 4 p 46), has made its first flight Production of the new French airliner is scheduled to begin before mid-1954 Air France has ordered 24 H.D 32s

Panair do Brasil Constellation has made the first nonstop crossing of the South Atlantic, flying 4,800 mi from Lisbon to Rio de Janeiro The flight inaugurated the Brazilian carrier's new Europe-South America service

First turboprop Viscounts of a 15-transport fleet ordered by Trans-Canada Air Lines will be delivered by Vickers Armstrongs next September Cost of TCA new fleet $11 5 million

Avensa Venezuelan airline has taken delivery on the first of three Convair 340s on order, plans to put the transport in service over its 2,000 mi domestic route system in the near future

Bilateral an agreement will be signed by France with Venezuela this month is expected to provide authorization of two new routes for each of the contracting nations. Linea Aeropostal Venezolana probably will extend its trans-Atlantic service to Europe immediately after the agreement is signed, authorities in Caracas report

The Aviation Week
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Picture Credits

7—Wide World; 9—(top center) North American Aviation (bottom) Hiller Helicopters; 14—(top) Lawrence J Herb, 16—Cessna Aircraft; 18—Bristol Aeroplane Co. 32—USAF Air Defense Command; 42, 46—McGraw-Hill World News; 78—United Press; 78—Howard Levy 88—PanAm, 89—UAL

SABRE BUILT FOR TWO—Here is prototype two-man tandem dual-control transonic TF-86F Sabre jet trainer (above and closeup, right) being tested by North American Aviation To get room for extra cockpit, NAA added 63 in. to the fuselage. (Story on p. 13)

New Jet Trainer, Military Copter Take to the Air

SABRE SCHOOLROOM—Closeup of new Sabre trainer shows clamshell type canopy Armament is two .50-cal. guns.

HILLER TESTS NEW JET COPTER—Hiller Helicopters' stubby 500-lb., two-place, ramjet-powered YHJ-1 copter is seen undergoing flight tests. Designated HOE-1 by Navy, the craft also is going to the Marines and to Army (H-32), with deliveries scheduled to begin in spring of 1954 Rotor diameter is 23 ft. The YHJ-1 features a small anti-torque rotor for fast control response.

INDUSTRY OBSERVER

► Watch for intensified crash-injury research in the design of future helicopters. Several manufacturers already have registered their willingness to consider the redesign of advanced models to improve survival chances of occupants. Preliminary studies offer some basis for belief that copters can be built to permit survival of occupants after a free fall of at least 50 ft.

► There isn't a chance that the Beech T-36 will go into commercial production, informed observers say. Designed and built to prototype stage, before the USAF contract was canceled last June, the plane has been mentioned frequently as a possible highspeed business aircraft. It was equipped with R2800 engines, was pressurized, and would have cruised at more than 300 mph. In even large quantities, however, it would have cost at least $400,000 apiece, and few firms appear ready at this stage to pay the price.

► Contract for a downward ejection seat to go into the new Lockheed XF-104 USAF day superiority fighter has been given by the manufacturer to the Stanley Aviation Corp., Buffalo, N. Y. This is the first downward ejection seat to be used in a fighter plane, according to an industry source.

► Some observers expect recently reorganized Air Navigation Development Board to launch a new revitalized program to develop the "ultimate common (civil-military) system" of navigation recommended by Special Committees 31 and 40 of the Radio Technical Commission for Aeronautics five years ago. Previous ANDB ultimate system projects were cut back sharply several years ago when military decided to develop a similar system for its own tactical use (Aviation Week Dec. 7, p. 40).

► Convair designers say the B-36 now is beginning to approach its aerodynamic altitude limit, defined as height where stalling speed and maximum speed are the same. B-36's aerodynamic ceiling previously has been higher than power ceiling.

► Rival companies say Air Force support is making Phillips Petroleum a strong competitor in solid propellants for rocket motor applications. Phillips was designated contractor-operator of the 18,000-acre AF plant No. 66, formerly called the Bluebonnet Plant, at McGregor, Texas. Contracts cover development and production of solid fuels derived from petroleum.

► Big item in Glenn L. Martin Co.'s string of projects is the XP6M-1 Seamaster, four-jet, mine-laying seaplane. Several hundred engineers are assigned to the design, working towards a mockup-completion date of June this year. Debut of prototype is more than a year away.

► Company insiders say success or failure of Ryan Aeronautical Co. to gain a contract for its Model 72 side-by-side trainer now in Navy competition may result in a major policy decision by the firm on its future planning. Ryan has doubled its engineering force to more than 400 during the past year and has appointed former WADC fighter branch chief project engineer J. M. Herald as weapons system engineer.

► Convair R3Y-2 turboprop flying boat is being designed to greater capacity than current R3Y-1 Tradewind production series. New version will have bow-opening cargo doors like Douglas C-124, and will seat more than 100.

► Nuclear propulsion applications are being studied in recently activated department of Glenn L. Martin Co. Technical observers see this activity taking on increasing importance in the company's projected plans.

► One more reason justifying the belief that the first nuclear powered aircraft will be a seaplane: It will be considerably safer to obtain precautionary shielding on landing by lowering the "hot" elements into the water. Other arguments for water-based craft include lengthy takeoff run, which otherwise would demand special heavy-duty, extra-long runways, safety in emergency landings; removal from close proximity to inhabited areas. Military, originally for a land based plane, are beginning to consider seaplane.

► First of two Navy turboprop Super Connies on order from Lockheed is expected to fly sometime this spring, according to company sources.

WHO'S WHERE

In the Front Office

Frederic O. Detweiler is Chance Vought Aircraft's first president under the recently announced plan of United Aircraft Corp. to separate its Dallas airframe plant from the parent firm and set up a separate company (AVIATION WEEK Dec. 14, p. 14). Other new officers include: **Adm. H. B. Sallada** (USN Ret.), vice president; **N. V. Turney**, controller; **B. W. Whitten**, treasurer, and **J. J. Gaffney**, secretary.

Paul Gaynor has formed a new advertising agency, Gaynor & Co., in New York.

Samuel R. Winslow, partner of Winslow, Douglas & McEvoy, **Herbert L. Stern**, comptroller of Allen & Company, **Donald Agnew**, partner of Wicks, Riddell, Bloomer, Jacobi & McGuire, and **Louis L. Berg**, president of Great Empire Corp., have been elected directors of Aviation Equipment Corp., New York.

Changes

Neil Harrison is manager of Lockheed Aircraft Corp.'s new Field Service Division, Burbank, Calif. Other Lockheed changes: **H. W. Davis**, director of radio facilities for the corporate division, **Ray Meyers**, manager of California Division radio operations.

Karl Ulrich is regional representative in charge of Air Line Pilots Assn.'s new office in New York.

Ernest C. Brelsford has been elected treasurer of Thompson Products, Cleveland.

Arthur M. Rogers has been appointed controller of Titeflex, Inc., Newark, N. J.

Gordon Kaylor is new controller of Sumners Gyroscope Co., Santa Monica, Calif.

Brig. Gen. Joseph J. George (USAF Ret.), superintendent of meteorology for Eastern Air Lines, has been appointed deputy chief of the U. S. Weather Bureau, effective next spring.

George L. Rand has become chief of Civil Aeronautics Administration's Airways Operations Division, succeeding **Clifford Burton**, who has retired. **Henry Chandler** is new deputy chief of the division.

J. B. Walker and **John A. Lundmark** have been appointed assistant executive secretaries of Air Transport Assn.'s Air Traffic Conference Division.

August R. Tiburzi has been named general manager of Air Associates eastern branch at Hackensack, N. J.

Fred W. Gottschling has been promoted to director of engineering for Greer Hydraulics, Brooklyn, N. Y.

Honors and Elections

Edwin A. Speakman, general manager of Fairchild Engine & Airplane Corp.'s Guided Missiles Division, has been elected a fellow of the Institute of Radio Engineers.

P. V. H. Weems, founder of the Weems System of Navigation, and one-time president of the Institute of Navigation, has been selected to receive American Philosophical Society of Philadelphia's Magellanic Premium for 1954 for his invention of methods and instrument for celestial navigation.

Washington Roundup

Senators: In or Out?

Key senators to aviation are among the 32 up for re-election this year.

• **Sen. Edwin Johnson**, former chairman and top Democrat on Senate's Commerce Committee, may not run again. This would pave the way for Washington's Sen. Warren Magnuson, who sponsored Col. Joseph Adams for Civil Aeronautics Board, to become chairman should Democrats gain control of the Senate.

President of baseball's Western League, Johnson will decide Apr. 1 whether to drop out of baseball or Colorado politics.

• **Sen. Homer Ferguson**, key man on defense money as chairman of the Military Appropriations Subcommittee, faces a hard re-election fight if Michigan's Gov. Mennen Williams contests his seat, as expected.

Ferguson has carried the ball on Capitol Hill for Defense Secretary Charles Wilson and led the opposition to Gen. Hoyt Vandenberg's plea for restoration of USAF cuts. Vandenberg's campaign made little imprint in Michigan, home state of Ferguson and the general's uncle, the late Sen. Arthur Vandenberg.

Ferguson's role consolidated his position with General Motors Corp. officials, expected to be active in promoting his re-election.

• **Sen. John Sparkman's** challenger in the Democratic primary, Rear Adm. John Crommelin, is not expected to make much of a showing against the veteran political leader who has represented Alabama in the House and Senate for more than 17 years.

Sparkman and his colleague, Sen. Lister Hill, have been two of Air Force's most outspoken supporters. Crommelin retired from the Navy under pressure following his activities contesting the merit of long-range strategic air during the period of the much-publicized B-36 investigation. He drew only a small vote in his 1950 race against Hill. Airpower was not an issue in that contest, and isn't expected to be injected into this year's campaign.

Sparkman is best known in air transport circles for his strong backing of the nonskeds' case as former chairman and a member of the Senate's Small Business Committee.

• **Sen. John Sherman Cooper**, chairman of the controversial commerce subcommittee appointed by the late Sen. Charles Tobey to review civil aviation law, may have to meet the formidable opposition of former Vice President Alben Barkley in Kentucky. Scheduled airline interests are skeptical that the inquiry may develop into a publicity platform for nonskeds. Cooper is co-author of the Kennedy Bill whose proposals are strenuously opposed by scheduled lines.

• **Sen. Estes Kefauver**, who led an unsuccessful fight against confirmation of Air Force Secretary Harold Talbott, is considered a certainty for re-election.

His opposition to Talbott was based on the aircraft production performance of the Dayton-Wright Co. during World War II. Talbott at the time was president of the firm, formed by his father. In the final showdown, Kefauver won only six votes against 76 votes for confirmation.

• **Sen. Leverett Saltonstall** probably will be opposed in Massachusetts by an ardent Air Force proponent, former Rep. Foster Furcolo. As chairman of the Armed Services Committee, Saltonstall has been uncontentious and generally has seconded the recommendations of the Defense Department.

Saltonstall also is a member of the Military Appropriations Subcommittee which saved the third Forrestal-class carrier after House Appropriations Committee banned funds for its construction.

He has gone along with the scheduled industry on air-mail subsidy legislation, and his record probably will be challenged by Massachusetts' other senator, John Kennedy.

• **Sen. Margaret Chase Smith**, a lieutenant colonel in the Women's Air Force, has no opposition in sight in Maine so far. A strong Air Force proponent, she was one of only nine senators who voted against a cutback in funds for the 70-group USAF buildup a few years ago.

Last year, she supported Administration's cuts in USAF's budget in the final showdown, after considerable rowing with Secretary Wilson. She considered Wilson's replies to 32 formally submitted questions on the merits of airpower evasive and unsatisfactory.

She opposed banning certificated freight carriers from subsidy and also a lement mail rate for international carriers, taking the opposite position to her former colleague and political foe, Sen. Owen Brewster.

• **Sen. Paul Douglas**, who can be counted on to continue an active fight against airline subsidies, faces a hard re-election fight. Three Illinois Republicans, including Edward Hayes, former commander of the American Legion, already have made bids to contest his seat.

A Marine lieutenant colonel in World War II, Douglas has spearheaded moves to expand the Corps. After several years' supporting cuts in USAF's budget, Douglas recently announced a change of heart—after talks with Sen. Stuart Symington. He said he regretted voting for Wilson's reduction in USAF procurement money, and wouldn't do it again.

• **Sen. Styles Bridges**, chairman of the Appropriations Committee and top-ranking member of the Armed Services Committee who pushed the hearings leading to the cancelation of the Kaiser-Frazer contract for C-119s, doesn't seem to have any serious opposition in New Hampshire.

His main political problem: placating the citizens of 300-year-old Newington-Portsmouth who are opposed to construction of a bomber base nearby. Bridges has supported the installation which would bring with it a $27-million-a-year payroll. He went along with the scheduled airline position on subsidy legislation and is chairman of the subcommittee on CAA and CAB budgets.

• **Sen. Karl Mundt's** opposition hasn't shown itself yet. He kept hands off in the last South Dakota Senate campaign which pitted CAB member Chan Gurney against Sen. Francis Case, a member of the 1948 congressional Aviation Policy Board. He endorsed Gurney for the CAB post.

Mundt was one of the handful of senators that opposed Democrat Administration cuts in the 70-group buildup, but this year went along with USAF money reductions recommended by Wilson. He is a co-author of the Kennedy Bill, and a member of the Appropriations Subcommittee on CAB and CAA.

—Katherine Johnsen

AVIATION WEEK

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Truce Report From Korea

Red Asia Now Bristles With Modern Jets

- **Communists have 2,500 MiGs based in Far East.**
- **And 700 Il-28 bombers replace obsolete Tu-2s.**

By A. W. Jessup
(McGraw Hill World News)

Fifth Air Force, Korea—Five months of immunity from air attack and direct observation have given the Communists an opportunity to build a formidable air position in North Korea.

They have made the most of it, according to Lt. Gen. S. E. Anderson, commander of the Fifth Air Force, who gave AVIATION WEEK this estimate of present Communist strength:

• **Aircraft.** The Reds now base an estimated 100 Ilyushin Il-28 twin-jet light bombers in North Korea, plus two to three times this number of MiG-15 interceptors.

• **Reserves.** At least 50 Il-28s are located in Manchuria with 125 to 150 more based in other parts of Communist China. Red Asia has more than 700 of these bombers. MiG strength probably exceeds 2,500—about half of them on Korean, Manchurian and Chinese bases.

• **Airfields.** More than 30 bases now have one or more runways in good condition. Five fields are in full operation, according to radar plotting of Red air activity. Another 14 lack only the aircraft, which can be flown in from Manchuria or Siberia in a matter of minutes.

▶ **Realistic View**—Recently, Gen. Anderson's staff prepared a document stating that the present state of alertness of FAF was adequate to defeat any surprise attack. The general took a more modest and realistic view, changing the assessment to indicate that the readiness would "minimize" the effectiveness of a surprise air attack.

The degree of minimization would depend upon the Communist commitment. If the Reds threw in only the forces based in North Korea and Manchuria, Anderson is confident that Fifth could win back air superiority over Korea in seven to 20 days. Further commitment of Red airpower from China proper would make the battle tougher.

Yalu Barrier Out If War Restarts

President Eisenhower, in announcing the withdrawal of two divisions from Korea, indicated that Communist China no longer would be inviolate from air attack should the Reds start shooting again.

This view was amplified by Secretary of State John Foster Dulles, who told newsmen: "... There has been ... a substantial buildup of sea and airpower (in the Far East). If there is a renewal of hostilities in Korea or if the Chinese Communists should openly intervene in Indo-China, the reactions on our part would not necessarily be confined to the particular area which the Communists choose to make the theater of their new aggression."

(During the Korean hostilities Allied planes were restricted by the U. N. command from crossing the Yalu River in North Korea.)

Dulles refused to disclose details on the buildup of U. S. Far East air power, but said forces will be maintained at appropriate levels to take account of our commitments. "These forces will feature highly mobile air and amphibious units," he said.

Observers saw these reasons behind the Administration's views:

- **Rising output** of jet-powered aircraft, including bombers and fighter-bombers.
- **Plans to use atomic weapons** in strategic actions if circumstances warrant.

Full commitment of the entire Communist Far Eastern air strength undoubtedly would open up a global war, and only a miracle could save Anderson's forces from being overwhelmed, along with the Eighth Army, and perhaps much of the Far East Air Forces based in Japan. Sheer weight of numbers, operating in mass attacks from short range positions upon Fifth's limited number of bases in Korea, would be decisive. But anything less would give Fifth and FEAF a fighting chance.

▶ **Powerful Force**—Gen. Anderson was quick to contradict when Red developments were called an air buildup. He and his staff stress that the Communists have not built up their forces during the past 18 months. They have only redisposed and modernized their air units.

• Il-28s have replaced Tu-2s.

• MiGs have replaced piston engine fighters, like the Yaks.

The significant fact is that the Reds now have a powerful, modern, nearly all-jet air force in Asia, dispersed on a wide arc from Kamchatka through Sakhalin, Manchuria and North Korea to China proper.

To offset advantages handed to the Reds by the cease fire, Gen. Anderson has revamped the Fifth Air Force.

Last summer, every disposition was for offensive action; now the posture is basically defensive, although fighter-bombers here and FEAF's Bomber Command are ready to strike back offensively if the Reds should start anything.

▶ **Two-Minute Men**—Practice alerts at USAF bases around the world, shown in newsreels in the states, usually start in the ready room with pilots awaiting call. But it is different here.

Parked at the end of takeoff runways you see a dozen or more F-86s, pilots sitting in the cockpits, helmeted and ready to go. The tower calls, pilots' hands go up, airmen turn on the auxiliary power units for the starters. Within two minutes, these Sabres roll down the runway. Other Sabres are set up on five-, 15-, 30- and 60-minute alerts.

The two-minute men waste not a second getting off, for they all are aware that this alert could be the real thing, that the enemy may be only seconds away.

At 10 miles per minute, it takes only two to five minutes to get from the front lines to several major bases. The MiG-15, in which a North Korean pilot escaped to Kimpo Airfield outside Seoul last fall, stopped rolling on a taxiway before anyone knew what it was (AVIATION WEEK Sept. 28, p. 13).

▶ **Offense Position**—Recommendations that Fifth disperse to the rear have been turned down by Anderson. FAF has to make a fight for Korea under any circumstances.

If the Reds come full throttle, it will not make much difference whether air craft are near Seoul or outside Pusan; the enemy will be hitting everywhere and from a multitude of directions. If they come half-force, the general believes he can take them quicker and easier from forward positions.

In addition to its continuous interceptor alert (night fighters take over from the Sabres from dusk until dawn), Fifth has fighter-bombers ready to go.

Units should be post-holing North Korean fields within two hours. Fighter-bomber flights have their targets selected and bomb loads designated. All they need is the command to go.

If it can, Fifth will take on Red airbases and units in Korea. FEAF, with its Bomber Command and attached Strategic Air Command units, will go after the bases in Manchuria and China. If Fifth is too occupied in the air over South Korea, then FEAF's effort must be put on North Korean bases.

Of course, atomic bombs may be allocated for the neutralization of major enemy bases, both in North Korea and Manchuria. This could lighten the load considerably.

▶ **Stronger FAF**—In some ways Fifth Air Force is in better shape then ever. Its fighter-interceptor force was doubled by re-equipping two fighter-bomber wings with the F-86F.

This not only increased the available first-line interceptor strength but also improved the fighter-bomber capability. Not only is the Sabre considered the best fighter-bomber in the business, but it can carry out missions without escort and probably can get through to targets when other fighter-bombers would be forced to turn back in the face of determined MiG interceptors.

▶ **Better Fields**—The airfield situation is much better. Most runways are in the 9,000-ft. class and of concrete. All interceptor bases are revetted.

Dispersion still is unsatisfactory and is much less than on the Commie strips up north. Probably this is inevitable. The Reds proscribe any land they need in order to build their fields just the way they want them, and order the populace to labor on the construction at what ever pay, if any, the Red authorities decide. We suffer under handicaps.

Our command first must ask permission of the Republic of Korea for land. The ROK has been unwilling or unable politically to allow the use of any ground considered cultivable.

If the land somehow is made available, then the command must obtain funds from Washington to pay the labor (usually at rates far higher than the country's standard).

This is right and in accord with the objectives for which we have fought but, in strictly military terms, is expensive. Is cost relative to that of Red opposition, it probably is exorbitant.

▶ **Improved Radar System**—Redisposition of old equipment plus installation of new equipment has improved the radar warning system greatly.

Prior to the armistice, the warning net was negligible. Navigation was the primary requirement for the electronic equipment. Included were the night guiding of B-29 and B-26 bombers onto enemy targets.

Now search and warning is the primary role. However, even if the system works to perfection, it cannot provide more than a few minutes warning of an enemy attack.

▶ **Economy Toll**—Budget cuts have taken some toll of Fifth's readiness for any renewal of the war.

Most noticeable is the limit on flying time for F-84 pilots. They currently are allowed 19 hr. per month (only recently increased from 14), far short of the 25 hr. considered necessary for a pilot to maintain combat readiness.

F-86 and B-26 pilots have been getting their full 25 hr., but only because the pilot level has been cut down from 1.5 to 1.2 per aircraft.

Pilot shortage? Not exactly, but Anderson says he will need replacements in a hurry if this war gets hot again.

But personnel cuts have hurt both in maintenance and in mobility. Engine maintenance personnel is below authorized strength. Fifth is completing a forced-draft training program, upgrading personnel to fill shortages.

▶ **Consolidated Housekeeping**—To maintain combat effectiveness, Fifth sacrificed mobility by consolidating the housekeeping chores of two wings on most bases.

Typical is one base on which half of the interceptor strength and nearly all of the reconnaissance capability are located. Prior to the cut, both wings were completely independent and mobile. Now, only the combat operations of each wing are independent. Everything else has been consolidated.

Combat groups can move quickly but the complex of accessory installations are so interlocked that it would take considerable time to sort out parts which should go with each unit.

▶ **Transferred Priority**—One suspects from looking at the situation here that not only have the budget cuts had an effect but also that priority now is on some other area—perhaps Europe.

Have we calculated that the war will not be renewed here, or, if it is, then we will not want to sacrifice too much materiel and manpower in what could well be the Bataan of World War III?

In part there is the calculated risk that the Communists do not want the war reopened. For strategic reasons the Chinese must maintain positions across the middle of Korea, much as the U. S. would hold a line at any cost across the middle of Florida if a Russian force invaded that peninsula from the south. But they have been warned that no bombs would be barred if they renewed their aggression.

The U. S. "threat" was backed up recently by the flight of F-84s from Japan to Bangkok, utilizing air-to-air refueling enroute. It not only made a nice gesture to the Thais but warned the Reds that we have a jet atomic-bomb carrier here, which could be refueled at altitude, for long-distance runs into Manchuria, China or Siberia.

North American Tests Tandem Sabre Trainer

A two-seat tandem transonic trainer version of the famed F-86F Sabre fighter-bomber (AVIATION WEEK Oct. 26, p. 11) has made its first successful test flight and now is undergoing flight evaluation by North American Aviation.

No orders have been announced. The newest Sabre to fly is designed to provide advance pilot training in high-speed flight, gunnery and dive bombing. It is designated the TF-86F (pictures on p. 9).

The company says only two modifications to the F-86F's airframe were necessary to convert it to a trainer: a 63-in. extension to the fuselage between the nose and wing roots, lengthening fuselage to 42 ft. and moving the swept wings forward eight inches. The tandem cockpits have dual controls and a duplicate instrument panel. Armament has been reduced to two .50-cal. machine guns from the Sabre's normal six .50s.

▶ **Wing Slats**—The TF-86F uses the slatted leading edge wings of earlier Sabre models which reduce stalls at low speeds and permit slower landings. As a result of combat experience against MiG-15s in Korea, the F-86F fighter-bomber incorporates a new wing minus the leading edge slats which improved maneuverability at a slight sacrifice in landing characteristics (AVIATION WEEK Sept. 7, p. 15).

The TF-86F is powered by a General Electric J47-GE-27 turbojet and is in the 650 mph. class with a maximum service ceiling of 45,000 ft.

In addition to the fighter-bomber's normal complement of instruments, the new trainer model has a North American-developed intercommunications system, an omni-directional range receiver, instrument landing system and a directional finder. The instrument consoles in front and rear cockpits are lower and wider than in the F-86F.

▶ **Ejection Seats**—There are separate ejection controls for the clamshell cockpit canopy and the seats and seat belts open automatically after ejection. Ejection seat controls may be operated from either seat armrest.

ILYUSHIN 28 2 (shown in artist's drawing) is tentative designation for modified light bomber with sweepback, increased engine thrust.

Reds Increase Light Bomber Performance

Russia has made two major modifications in its Il 28 to bring performance of the obsolescing light bomber to a contemporary level

• **A new wing planform** with 40-deg sweepback replaces the original straight wing geometry

• **Engine improvements** have boosted the thrust of the axial-flow turbojets to 5,500 lb

Combined effect of these modifications has raised the Il 28's top speed to more than 650 mph Ceiling still is approximately 45,000 ft

These first details and the exclusive inflight photograph of the new model in Ilyushin's tactical aircraft series were sent to AVIATION WEEK by a source behind the Iron Curtain The same observer collected data for an earlier authentic article on the Il 26 and its sister ships (AVIATION WEEK Mar 30, 1953, p. 30)

► **Rush Job**—The sweptwing Ilyushin is considered an interim type by the Red air force and was rushed into production to equip squadrons long overdue for modernization

These units were slated first to get the much-rumored Type 150, reported as a development of the German wartime Junkers 287, a swept-forward, four or six-jet bomber

The Type 150, extensively redesigned as a twin-jet sweptback aircraft by a German design team working in Podberesje under former top Heinkel designer Siegfried Guenther, failed to meet its performance promises

The Red air force, pressed for new equipment, ordered a "quick-and-dirty" modification for the Il 28 Production lines—which, according to late intelligence estimates, had supplied upwards of 700 of the planes to Red Asia alone—were switched over to the new model

Deliveries must have begun toward the end of 1952, because the first sweptwing models were seen by late spring of last year By early fall, squadrons were operational and observed over the Red Zone of Germany (AVIATION WEEK Sept. 28, 1953, p 10)

FIRST PHOTO of Red Il-28-2 bomber.

Few have been seen in recent weeks, but this probably is because of the virtual abandonment—towards the end of 1953—of the Russian Zone as a base of military air operations by the Red air force

► **Dimensions**—Wingspan of the new Ilyushin is 72 ft., same as that of its straightwing predecessor, measured between outer extremes of the cylindrical tiptanks

Fuselage length is reported as 12 ft longer, making the new dimension also 72 ft. This is an extremely large increase and should be considered as a rough estimate only

Heavier armament is a feature of the new modification; four 23-mm cannon fixed in the nose and a pair of 23-mm cannon in a manned tail turret make up the armament roster

As with the straightwing models, not all the planes are fitted with external tankage at the wingtips. These are believed to be part of the builtin fuel system of certain sub-models and are not jettisonable tanks

A three-man crew is standard with this aircraft series when used as light bombers —DAA

U.K. Tests Jet-to-Jet Refueling in Canberra

(McGraw Hill World News)

London—A converted twin-jet Canberra Mk. 2 tanker took to the air last week for Britain's first jet to jet flight refueling tests.

Flight Refuelling, Ltd. whose probe and drogue system has been adopted for several U.S. Navy aircraft and is being tested by USAF in a converted Boeing B-47B, is conducting the tests in the U K A Meteor Mk. 8 fighter is acting as receiver

Conversion of the Canberra involved bomb-bay installation of Flight Refuelling's hose drum unit, which controls flow of fuel from the tanker to the receiver and the "spring-blind" action of the hose.

► **Simple Switch**—"It has proved beyond doubt how simply a bomber can be turned into a tanker," says Flight Refuelling's chairman, Sir Alan Cobham. "It has also disposed of the lingering idea that one must build special aircraft to act as tankers ..."

"With this new equipment a bomber or a transport aircraft, if equipped with the necessary fixed fittings, can be converted into a refueling tanker in the minimum of time, as 70% of the equipment required is already installed for the purpose of ground refueling The remaining 30% can be added very simply and quickly as a package unit"

Apart from the hose drum unit connected to the Canberra's normal existing fuel, hydraulic and electrical systems, the only other equipment Flight Refuelling has had to install is a small operator's panel from which the operation is controlled

► **Possible Tankers**—At present the RAF has no tanker aircraft It is extremely unlikely that Britain's tight defense budget could be stretched to make room for a specialized tanker aircraft

English Electric Canberras, some 500 of which will be flying with RAF Bomber Command before another year is out, might be converted

So might the Vickers four-jet Vibant bomber, but that day will be a long way off because quantity deliveries of Valiants are not expected before 1956

Another possibility is de Havilland Aircraft's Comet 1s which ultimately will be replaced by Comet 2s and 3s

Canadians Order 1,200-Mph. CF-105

Toronto—Canada's Defense Department has ordered the new CF-105 delta-wing twin-jet fighter into production at A V Roe Canada for the Royal Canadian Air Force

The new fighter (AVIATION WEEK Nov 2, p 11) of which little is known officially, will be built at the Avro Canada plant near here defense production minister C. D Howe reports First CF-105 is expected to be completed by the end of 1955

Unofficially the CF 105 is said to have a speed of about 1,200 mph; range of approximately 1,500 mi Armament will consist of rocket missiles The plane will weigh approximately 30 tons

► **Near-Vertical Climb**—Avro Canada also is expected to produce the CF 105's new jet engines, expected to be much more powerful than the company's Orenda turbojets now going into its CF-100 all-weather fighter and Canadair-built Sabres

The new powerplants probably will give the CF 105 a near-vertical-climb performance eliminating need for long runways

1954 CESSNA 180 Businessliner sells for same price as last year $12,950.

Cessna Outlook: 'Very Promising'

Cessna Aircraft Co reports a "very promising" outlook for future commercial sales, boosted by plans to put its new twin-engine Model 310 executive plane on the market this year

The Wichita airframe builder predicts military sales will remain at approximately 1953's volume of $27,683,243 for the next two years, a forecast based on its estimated backlog of $50 3 million and present schedules.

► **Profit Drop**—In a report on fiscal 1953, Cessna reveals net earnings after taxes totaled $1,126,587, falling short of the previous year's level by $35,000. The company blames this "small decline" on unexpected high costs in early months on the Model 180 and a low profit margin on its L-19 observation-reconnaissance plane

Increased commercial orders pushed sales to a total of $43 360,931, topping 1952 by $2,488,729

► **First Copter**—Cessna's CH-1 helicopter, first rotary-wing craft designed by the company, is going through flight tests and is scheduled for certification

The producer also reports

• **Prototype XT-37** twin-jet trainer, winner of USAF's $2.5-million design competition last year, will be flying before the close of fiscal 1954 Cessna says the trainer "can mean potential production"

• **Improved performance** version of the L-19 "is about ready to be procured by a military agency"

• **Model 310** is undergoing acceleration and service tests and has passed CAA certification

► **S2F Orders**—Defense Minister Brooke Claxton says the Royal Canadian Navy will be equipped with the new Grumman S2F anti-submarine plane to be built by de Havilland Aircraft of Canada (AVIATION WEEK Jan 4 p 7) It appears likely that the RCAF also will get S2Fs, although the major portion of the contract will be for the RCN.

Industry observers calculate that the initial S2F order covers approximately 100 planes costing about $400 000 each Possibly 150 additional aircraft will be purchased later

RCAF is getting six Piasecki H-21A Work Horse helicopters early this year from the U S for rescue purposes These will be delivered to its Edmonton base

The Canadian government also has ordered additional Sabre jet fighters and T 33 jet trainers for North Atlantic Treaty Organization nations as part of Canada's $300 million contribution to mutual aid in the fiscal year beginning Apr 1

Deliveries to USAF Increase 67%

Talbott reports Air Force received a record 2,700 aircraft from industry in second half of fiscal 1953.

Great strides in production progress and optimism over the present state of the nation's defense highlight the semi-annual report submitted to the President by Defense Secretary Charles E Wilson and his three service secretaries for fiscal 1953.

Efforts to achieve more defense for less money progressed satisfactorily during the first six months of his administration, Wilson says.

▶**Production Gains**—Production of military supplies and construction of military facilities increased 35% during fiscal 1953, the Secretary reports.

Of that, "deliveries of aircraft and engines during fiscal year 1953 more than equaled deliveries during the previous two years. . . Production of military aircraft was averaging over 900 per month during the last half of the year," Wilson says.

"The type of military strength that we must continue to develop is one that is both effective in deterring further aggression and capable of being sustained over a prolonged period. It must neither undermine the standards or the ideals by which we live nor endanger the strength of our economic system.

"In these changing times only the frequent reappraisal of all factors can continue to give us the military establishment for the security of our country."

▶**Peak Deliveries**—In a wrapup of USAF activities during fiscal 1953, Air Secretary Harold E Talbott reveals that deliveries of aircraft to the Air Force during the second half of the year reached a new high of more than 2,700, a 67% increase over the comparable period of 1952.

Deliveries during the year, he says, totaled more than 4 000 aircraft.

Talbott reports USAF made 778,730 purchases totaling $14,210,590,000 from U S companies in 1953. Of the total, 21% was placed with small business firms.

▶**Marginal Advantage**—USAF spent $525 million on research and development during the year, the Air Secretary reveals.

"This substantial support made possible an extensive effort directed toward developing the advanced air weapons essential to the survival of the United States in this atomic age. Any marginal advantage of this nation over potential enemies lies predominately in the technical superiority that it currently enjoys and obviously must labor to maintain," he says.

▶**C-124 Changes**—In the transport field, Talbott reports that Douglas Aircraft's C-124 Globemaster "will incorporate major changes to provide new capabilities. To bring the fuselage closer to the ground for ease in loading, the wing will be elevated. Other new features will include in-tail loading, pressurization and a turboprop powerplant."

He also mentions the new C-130 medium transport being developed by Lockheed Aircraft for support and assault missions. It is the first designed to utilize the new Allison T-56 turboprop engine.

"In the past year, eight new transport squadrons were activated," Talbott says, "in addition to a third air resupply and communications wing. The MATS fleet, including U S Navy components, increased from 1,074 to 1,314 aircraft. Numerically, the sturdy C-54 formed the backbone, although additional large C-124 transports were placed in operation."

▶**Potent Weapon**—Navy spent $2 1 billion for new aircraft during fiscal 1953, Navy Secretary Robert B Anderson reveals.

He says Navy's most potent weapon is the aircraft carrier task force because "it is a mobile, fully equipped air base which can operate over three-quarters of the globe, projecting its aircraft against the enemy and at the same time presenting a small and elusive target. The aircraft carrier with its bomber and fighter planes is the core around which the fleets are built."

Anderson reports steady progress in modernizing the Navy's force of 13,400 aircraft. He says as aircraft embodying the latest developments were delivered to the operating forces, the Naval Air arm's degree of modernization, "as measured by the proportion of modern aircraft in front-line aviation units," rose from about 28% in June 1952 to 56% in June 1953.

"An outstanding achievement in adapting aircraft carriers to handle modern highspeed aircraft has been the development of the canted deck," he says.

▶**$170.5 Billion Available**—In his detailed year-end report, Wilson told the President the Defense Department had $170 5 billion available in the three years since the beginning of the Korean hostilities.

Procurement and construction funds amounted to $119 3 billion, with $97 6 billion slated for procurement of hard goods, $11 4 billion for soft goods and $10 3 billion for military construction.

▶**Economy 'Suffers'**—By the end of the fiscal year, he says, the department had obligated $109 2 billion of the $119.3 billion made available for procurement and construction, $91.1 billion for hard goods, $11.3 billion for soft goods and $6.8 billion for construction.

These totals, he explains, include funds appropriated directly to the Department of Defense as well as military assistance funds appropriated to the President and allocated to the department by the Director for Mutual Security.

Investment of such enormous sums within a span of three years cannot be carried out without mistakes and excesses, Wilson says. Economy and efficiency "suffer when the need for rapid expansion is of paramount importance in the interest of national defense."

Daman Tests Helicopter Duo

Recent view taken at Doman Helicopters, Inc., Danbury, Conn., shows two YH-31 U. S. Army helicopters undergoing flight trials. Craft hovering at right, which first flew Nov. 11, has been instrumented for CAA's strain gage and flight test program and is also being used as a demonstrator. YH-31 tied down at left has accumulated approximately 80 hr. of trials, mostly tied down endurance time.

Safety Award Winner

In a photograph showing winners of the Flight Safety Foundation's 1953 air safety awards (AVIATION WEEK Jan 4 p. 14), Carl Christenson, director of safety for United Air Lines, was inadvertently identified as Dr. Ross A. McFarland, honored by FSF for his book, "Human Factors in Air Transportation."

Mr. Christenson accepted the award for Dr. McFarland who was unable to attend the presentation.

BEA Official Blasts U.K. Aircraft

Airline's chief engineer charges British workmanship is inferior to U. S.; plane producers demand proof.

By Nat McKitterick
(McGraw-Hill World News)

London—Britain's aircraft builders, stung by a British European Airways official's charge that their workmanship is inferior to U S plane producers, have put the burden of proving the accusations on the airline.

BEA chief engineer B S Shenstone created a furor in the industry and became probably the most unpopular man in U K aviation when he told a conference of the Institution of Production Engineers: "There is more consistency in articles of American manufacture than in articles of British manufacture."

Society of British Aircraft Constructors asked BEA chief executive Peter D Masefield for full technical details on the engineer's complaints. Industry observers forecast Shenstone will not be hard pressed to present evidence backing up his claims.

▶**"Worst Aspects"**—Speaking in his official capacity, the chief engineer also told the conference:

- "In the U K., the average finish given to an aircraft is far inferior to that given to the average American aircraft . . ."
- "One of the worst aspects of workmanship in the U K. at present is electrical wiring . . . Within the last two months an operator who bought new British transport aircraft has had to strip them all of electrical wiring and renew it before they could put this type into operation . . . The operator is . . . fed up . . ."

Coming from such an authoritative source, the BEA engineer's remarks made the front pages of most of Britain's air-minded press. Industry comments came thick and fast in the wake.

Commented SBAC: "Some points of criticism (at the conference) seemed to appeal less to the trained technical mind than to the emotions of the public."

Specific companies chimed in with a chorus of "Not Us!" Said Vickers Armstrongs, makers of the turboprop Viscount transports, "We have the authority of BEA to state that the Viscounts have given BEA full satisfaction in these respects (mentioned by Shenstone)."

Sir Miles Thomas, chairman of British Overseas Airways Corp., quickly exonerated the de Havilland Comet jet liners by saying he could not subscribe to or substantiate Shenstone's criticisms.

▶**Evidence**—Authorities cite three cases as evidence substantiating the engineer's charges.

- His specific reference to the operator of new British equipment who had to rewire his fleet will find confirmation with Trans-Canada Air Lines.

TCA took delivery of three Bristol Mk 31 Freighters last fall. All had to be rewired before they went into service.

Trans-Canada had asked for electrically driven instrumentation but agreed to do the job itself when Bristol said the requirement would delay delivery.

- Shenstone could list extensive electrical troubles BEA had in introducing the de Havilland (Airspeed) Elizabethan transports more than a year ago.

Built by Airspeed before the company was absorbed by DH, the Elizabethans were delivered to the carrier with countless bugs. Airspeed never had built a metal aircraft before and the production of Elizabethans was stopped after DH took over.

At great cost—some of which was recouped by charging de Havilland penalty payments against late delivery—BEA worked all the bugs out.

For some time now the comfortable, high wing transport has been returning a profit to its operator.

- Or Shenstone could point to BOAC's 19 Handley Page Hermes transports, currently pasturing at London Airport for want of a customer.

The airline ordered 25 Hermes—civil version of the Handley Page Hastings military transport—in 1947, got them into service in 1950, started disposing of them all more than a year ago.

According to a recent Parliamentary debate, no less than 400 modifications were found necessary in that time. The aircraft still was being modified after BOAC had sold five to Airwork, Ltd., for troop transport some 18 months ago.

▶**Dragging Wings**—About aircraft finish, Shenstone says, "Parts and assemblies are not treated well in the shops, and in one wing factory, the impression received was that after manufacture they dragged the wings along the shop floor to get them out of the way."

He also says "Why do some British

Beecraft Plans New Lightplanes

Model of a new four-place all metal light plane on the drawing boards at Beecraft Associates, Inc., San Diego, is shown in above photograph of the firm's single-place all-metal Honey Bee personal plane, which recently received an approved type certificate from Civil Aeronautics Administration. The four-place, designated Queen Bee, is designed for a 150 hp. engine, spans 30 ft. and is estimated to have a 150-mph. cruise speed. Note the V tail. The high-wing Honey Bee is powered by a 65 hp. Continental and cruises at 110 mph. Span is 28 ft., length 16 ft. 10 in., and gross weight 860 lb. An 85 hp. two-place version of the Honey Bee also is under consideration. It will cruise at approximately 125 mph. Earlier the firm built the single-place, Wee Bee, which pilot flies from a prone position. It was demonstrated here and abroad in 1948-1949.

Bristol Tests Big Copter on Carrier

BRISTOL 173 MK. 1 comes in to land on HMS Eagle for three-day trials at sea. Data was collected on twin-rotor copter's behavior during varying degrees of deck motion, rotor blade starting and stopping characteristics, maneuverability on deck and storage.

DECK TRIALS included stationing 173 in various positions in relation to wind coming over deck. Rotor starting and stopping were "successful" in 15, 20 and 30-kt. winds, blade folding and unfolding were done in 30-kt. wind.

STOWAGE BELOW DECK was tried with rotor blades folded to simplify handling. Here Bristol 173 has been maneuvered off the elevator and is moving into HMS Eagle's hangar. Trials were to get information on characteristics desired in a carrier based copter.

manufacturers . . . still find that flush riveting is too difficult and make unimpressive excuses for the use of snap-head and brazier head rivets? . . . Aircraft with such rivetings are much more difficult to keep clean . . .

"Lack of consistency has plagued BEA among other things on ailerons, which—although they are supposed to be identical—are, in fact, not so. In more than one type, when we change the aileron we have to test flight it and make numerous adjustments so that the feel of the ailerons is satisfactory."

▶ **30,000-Hr. Target**—Most of Shenstone's criticisms revolve around the problem of "long life which we must have in aircraft work." The engineer set a target of 30,000 hr. without "dangerous fatigue" as his objective for British European equipment.

While pointing out that "there are DC 3s existing which have flown more than 40,000 hr. and have taken more than 15 years to do it," he finds the highest figure racked up by a BEA aircraft only 10,623 hr.—logged by Vickers Viking after seven years service.

▶ **Timely Warning**—By their nature, almost none of Shenstone's remarks have any relevance to Viscounts or Comets, still too early in operation for such an appraisal. But a few in the British industry say they believe the warnings were timely.

What Shenstone says of British aircraft builders countless Anglo-American productivity teams have said of other U. K. industries. The best production practice may be very good indeed, but the average is none too high.

▶ **U. K. Revolution**—British production got another hard look at the conference from S. P. Woodley, superintendent of Vickers-Armstrongs' Supermarine Divisions.

Citing many examples from the U. S., Woodley forecasts a "distinct revolution" in airframe manufacture in Britain in the near future, a revolution into integral construction methods now well in practice in America.

Current trends in aircraft design mean "an ever increasing accent on machining and a reduction in pure metal sheet forming and assembly", Woodley believes. "It is imperative that we have presses installed in this country of not less than 35,000 tons capacity and better still of 50,000 tons."

▶ **Tough Problem**—The need for Britain to shift to American style integral construction poses a very tough economic problem for Britain—a problem both Woodley and Short Bros. chief designer David Keith-Lucas stressed.

Woodley says, Britain should "concentrate its production effort on one or two aircraft only" in the fighter field. This would give the longer production runs needed to amortize a huge production investment.

1953 Estimated Civil Air Operations

	1952 (Actual)	1953 (Estimated)	% Change
U. S. civil aircraft	89,313	91,000	+2
Scheduled air carrier aircraft	1,367	1,420	+4
Two-engine	791	813	+2
Four engine	558	587	+5
Other	18	20	+11
Civil aircraft manufactured	3,509	4,290	+22
1- and 2-place models	544	3,990	+31
3-, 4-, and 5-place models	2,512		
Over 5-place models	453	300	−34
Civil airports	5,679	5,500	−3
Scheduled air carrier operations*			
Total revenue passengers	27,385,276	31,981,000	+17
Domestic	25,019,742	29,223,000	+17
International	2,365,534	2,758,000	+17
Total revenue miles	562,066,704	631,780,000	+12
Domestic	458,563,946	520,929,000	+14
International	103,502,758	110,851,000	+7
Total revenue passenger-miles (000)	15,549,388	18,179,000	+17
Domestic	12,528,437	14,750,000	+18
International	3,020,951	3,429,000	+14
Total passenger miles (000)	16,177,297	18,912,000	+17
Domestic	13,005,138	15,312,000	+18
International	3,172,159	3,600,000	+13
Total express and freight ton miles	233,493,670	256,725,000	+10
Domestic	160,819,801	183,978,000	+14
International	72,673,869	72,747,000	+0.1
Total passenger fatalities	140 (8 acft.)	88 (6 acft.)	
Domestic	46 (5 acft.)	86 (4 acft.)	
International	94 (3 acft.)	2 (2 acft.)	
Total passenger fatalities per 100 million passenger miles flown	0.9	0.5	
Domestic	0.4	0.6	
International	3.0	0.1	

*Source: CAB data. 1953 CAA estimates based on nine months actual data. All-cargo carriers not included.

Civil Aviation Sets New Records

Scheduled airline passenger traffic increases 17%, safety improves, and aircraft production climbs 22%.

Scheduled air transport operations during 1953 grew at rate nearly twice as fast as in 1952 and the safety record continued to improve noticeably, Civil Aeronautics Administration reports in a roundup of last year's civil aviation activities.

New highs also were reached in the number of civil aircraft manufactured, flying hours and buildup of electronic navigational aids.

▶**Passenger Safety Record**—Although final-quarter figures lack official confirmation, CAA estimates that approximately 31,981,000 revenue passengers were flown on scheduled domestic and international carriers last year, a 17% gain over 1952's total of 27,385,276. Increase over the 1951-1952 period was 9%.

In safety, scheduled passenger fatalities last year came to 0.5 per 100 million passenger miles, compared with 0.9 in 1952 and 1.3 in 1951.

▶**Plane Output Increases**—There was a 22% gain over 1952 in the number of one-to five-place civil planes produced for business agricultural and industrial flying.

These activities showed continued growth in hours flown, contrasting with declines in instructional and pleasure flying.

Business flying headed the list of general air activities, with 3,124,000 hr., CAA claims.

▶**Traffic Tops 17 Million**—Landings and takeoffs of scheduled, irregular, general and military planes handled by CAA airport control towers is estimated to have surpassed 17 million last year, compared with 15,814,213 in 1952. Fix postings, recorded when an airplane reports passing a check point along the airways, topped 15 million in 1953, compared with 13,136,703 last year.

Net increases in electronic navigation aids last year included 23 instrument

CAA Airways Facilities

Airways mileage	
Colored (low-frequency) airways, controlled	72,531
Colored (low-frequency) airways, non-controlled	1,979
VOR airways, direct	54,225
VOR airways, alternate	21,294
Landing areas	
Intermediate fields	81
Jointly operated fields	42
Lighting aids	
Airways beacons (excluding landing)	895
Neon approach light lanes	76
High intensity approach light lanes	36
Navigation and landing aids	
Airport surveillance radar	17
Fan markers	287
Distance measuring equipment[1]	110
High power non-directional radio beacons	5
Instrument landing systems[2]	141
Low/medium frequency ranges	369
Low/medium power non-directional radio beacons	175
Precision approach radar	10
VHF omniranges[3]	378
VHF visual aural ranges	15
Communications facilities	
Interstate airways communications station	396
Overseas foreign airways communications station	15
Traffic control facilities	
Air route traffic control centers	31
Airport traffic control towers	116
Combined station/towers	52

[1]Includes 85 installations operating on test
[2]Includes 6 installations operating without glide slope
[3]Includes 3 TVOR installations
Source: CAA

landing systems, seven airport surveillance radars, 16 distance measuring equipments, nine very high frequency omni-directional radio ranges. Direct VOR airways mileages increased from 45,831 to 54,225.

►**Military Contracts Climb**—CAA also handed greater responsibility for supervision of work to approved repair stations last year, and these shops reported a 60% increase in the military contract work awarded them.

During the first half of 1953, the agency issued certificates or specialized rating to 35,350 airmen at a rate 11% higher than 1952.

Recipients included 16,685 student pilots, 1,556 airline transport pilots, 344 helicopter pilots, 3,237 mechanics and 2,096 control tower operators.

Los Angeles Airways Wins Subsidy Boost

Los Angeles Airways has won a final subsidy and mail pay increase of $137,489 for the back period Apr. 11, 1952 Sept. 30, 1953. Final current and future rate soon will be proposed by Civil Aeronautics Board.

The retroactive show-cause order of the Board proposes a profit element of $55,102 for the period. It also includes increased operating expense allowance to depreciate its Sikorsky S-55 helicopters over three instead of five years. For the future period, this depreciation change would increase expenses by $47,000 a year.

Temporary mail and subsidy rates are set to make the carrier break even only. The retroactive final rate increases adjust for the higher depreciation allowance and a profit and income tax element. The final future rate will do the same.

Arab York Freighter

(McGraw Hill World News)

Beirut, Lebanon—Air Liban has purchased a four-engine Avro York freighter from British Skyways Co. to fly between Beirut and Dahran, Saudi Arabia. Saudi Arabia has placed a ban on British airline operations.

Copter Future

- **NYA calls helicopter answer to traffic snarls.**
- **Rotary-wing craft is tied to urban planning.**

By Richard Balentine

Manhattan's answer to congestion of crosstown traffic—which today moves slower than "when horses drew the vehicles"—is the helicopter, says Glen B. Eastburn, assistant to the president of New York Airways.

Speaking before the American Helicopter Society in Washington, Eastburn remarked that 3,750,000 persons come into Manhattan below 60th Street every day and the same number depart every night.

"This generation has produced nothing that is going to be as significant in metropolitan planning and development as is the helicopter," he predicts.

▶ **'Doing a Job'**—The copter airline has been operating in the New York area for more than a year and began carrying passengers in July, believing "it was necessary to prove the economics of the helicopter".

"We believe we are doing a job," says Eastburn.

He cites three factors that will determine the helicopter's future:

- **Public acceptance.**
- **Operators acceptance.**
- **Economy.**

"The public is going to control the use of the helicopter," Eastburn says. "Noise I put down as one of the most important limiting factors to full utilization of this wonderful machine. That is the exhaust noise. The rotor noise is rather insignificant, but there is a great deal of confusion on the part of the public between noise made by the conventional aircraft with props and that of the helicopter."

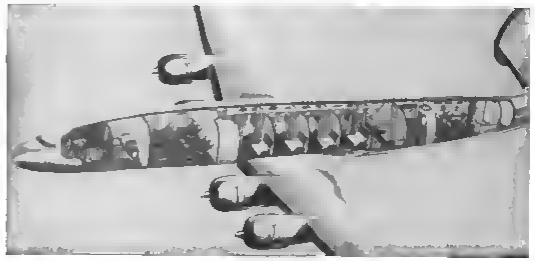
The New York Airways executive told society members that his company now operates at a minimum of 1,000 ft. on its routes between Bridgeport, Conn., and Trenton, N. J., 60 mi. on either side of New York.

"We could operate at 500 ft. but we prefer to operate at from 1,200 to 1,500 ft. to get high enough so that noise does not disturb people in the enjoyment of their homes," Eastburn says.

He says the public in some instances has confused the helicopter's rotor noise with the prop noise of conventional transports flying over the area.

▶ **Public Confidence**—A second engine or reserve power is needed in copters, he warns, to give the public more confidence. At present, NYA operates Si-

Air France Features Plush Flight



CABIN INTERIOR of Air France Super Connie in plush "Golden Parisienne" service seats 32 passengers with eight double Sky Room accommodations.

DAYTIME view of Sky Room, containing two forward facing seats. This private room costs $125 extra in addition to $25 surcharge for getting on transport.

NIGHTTIME setup with seats made into double bed. Air France flies Super Connie "Golden Parisienne" flights New York-Paris nonstop once weekly.

korsky S-55s, powered by a single Pratt & Whitney R2800 reciprocating engine.

He adds that the public would be given increased confidence in helicopter transportation if manufacturers would equip copters with pontoons for water landings, give them instrument operation and increase size and speed.

The latter would make the helicopters more acceptable to airline operators, Eastburn points out.

"We believe we should have a ship of about 4,500 lb. for our type of operation," he says. (Present weight is about 1,200 lb.) "We need 18 to 20 passenger copters. We now carry up to six and can carry seven with the crew."

He estimates speed should be 125 mph., as opposed to the 90 to 100 mph. at which the S-55 now cruises.

▶ **Operating Costs**—As to NYA's operation, Eastburn says the airline chalked up 611 hr. of revenue operation during October, operating around the clock between New York's La Guardia, Idlewild and Newark Airports and twice a day on suburban routes.

The carrier has flown 34,400 mi. with average daily utilization of 5 hr. 6 min. per aircraft at 33% load factor.

"Depreciation cost is $42 per hour of flight," he says, "maintenance $30 per hour, flying operations $31 per hour, and total operating cost $103 per hour of flight time.

"Flight operation and indirect maintenance is $38 per hour, general administrative $49 per hour, with a total of

Power Steering

"Tip toe" power-steered nosewheel is now standard equipment on all Aero Commander business planes. The system operates with the twin-engine plane's hydraulic brakes. Hydraulic steering cylinder can be seen mounted in a horizontal position just above the nose wheel. It also acts to damp nosewheel shimmy. An automatic centering device in the cylinder straightens the nosewheel prior to retraction into the wheel well.

$173 per hour cost flight time"

NYA has a charter rate of $230 per hour, including the 15% federal tax Although an "extremely high rate," he says, 'it is bought '

As to cost per passenger on regular operations, Eastburn told the society his company charges 50 cents per seat mile Cost of the flight between Idlewild and La Guardia is $5 per passenger and between Idlewild and Newark Airports $10

' We are charging a rate that is way beyond what the public is used to paying for as transportation but the time element is the all important factor "

FTL Director Buys $75,000 In Stock

Biggest stock transaction reported by Securities & Exchange Commission in its October summary, recently released, is the purchase by James E Davidson director of Flying Tiger Line, Inc., of $75,000 in convertible debentures, has total holdings of that type security

Other transactions reported to SEC

• **Air Associates, Inc.:** C Kenneth Baxter director, bought 100 common shares, raising his total to 600

• **Allegheny Airlines Inc :** Everett K Arnold officer bought 100 common shares his total holding

• **American Airlines Inc.:** H E Benedict director sold 100 common shares, leaving a 2 000-shares holding

• **Avco Mfg Corp :** Irving B Babcock, director sold 1 200 capital shares, leaving 6 807; William A Dees, officer sold 500 capital shares, his total holdings C. Coburn Darling director sold 3 000 capital shares leaving 5 000

• **Boeing Airplane Co :** A F Logan officer sold 504 capital shares his total holding

• **Colonial Air Lines, Inc.:** Francis Hartley, Jr director bought 300 common shares making a total holding of 1 800

• **Continental Aviation Engineering Corp.:** George T Truedle, Jr director sold 200 common shares, retaining 300

• **Eastern Air Lines Inc :** Everett R Cook, director and holdee of 5 400 common shares, sold through Cook Co 71% common shares, leaving 900

• **Lockheed Aircraft Corp.:** D E Browne officer sold 500 capital shares, leaving 1,775 total

• **McDonnell Aircraft Corp.:** James E Webb director bought 100 Class A common shares his total holdings.

• **National Airlines Inc :** C H Calhoun officer bought 500 common shares making a 550 share total

• **Republic Aviation Corp :** J W Powell director sold 1 000 common shares leaving 5 000

• **Seaboard & Western Airlines, Inc.:** Raymond A Norden officer and director sold 400 common shares leaving 33 087

• **United Air Lines Inc :** Curtis Barkes, officer sold 400 common shares leaving 61

• **Western Air Lines, Inc :** T J Taylor officer bought 200 capital shares, making a total holding of 350

NAA Wins Contract

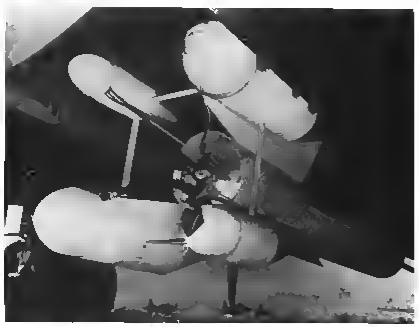
Reconditioned F 86s will be turned out by North American Aviation's Fresno (Calif.) Division under a $2-million contract granted by USAF Agreement calls for inspection and repair of 25 battle weary Sabres

Missiles, Sleds Test Out Chute Design

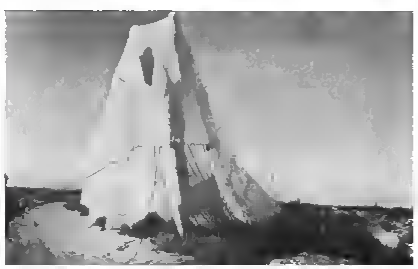
• AF checks new types of parachutes in drops from 20,000 ft. and on Mach 2 rocket railroad.

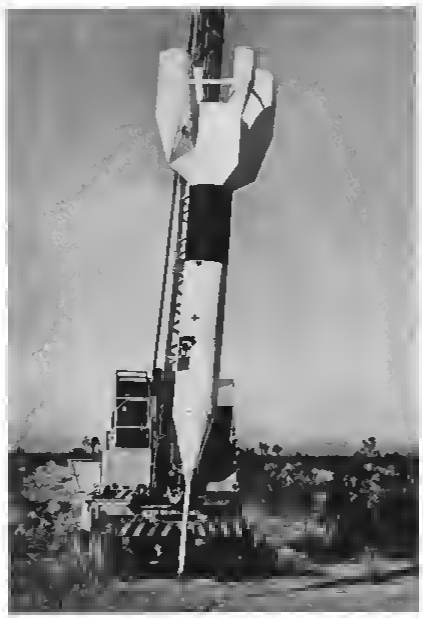
INSTRUMENTATION of highspeed sled is checked before supersonic run at AF Flight Test Center, Edwards AFB

DOWN THE TRACK flies Cook Research Labs' highspeed sled in test of Air Force parachute. Sled is powered by North American Aviation rocket motor. Speeds up to 1,500 mph. are reached on Edwards' 10,000-ft. highspeed track.



FIN FAIRINGS on Skokie house chutes, movie camera.





UNDAMAGED AFTER DROP FROM BOEING B-29, Cook Research Labs' Skokie free-fall missile is pulled from ground by mobile crane. The three-inch thick chrome-steel spike on Skokie's nose absorbs impact after drop from altitude during Air Force parachute tests at Edwards AFB. The highly instrumented missile reaches near-sonic speeds during its fall.

Missile drop tests and supersonic railroad rides are helping engineers of Cook Research Laboratories test parachutes for sonic-speed applications to contemporary aircraft.

Heavily instrumented "bombs" and rocket-propelled sleds, mounting a variety of parachute designs, simulate the conditions of the specific application. During brief test runs, avionic and photographic eyes record or transmit information which will help determine canopy shapes, opening shocks and loads on shrouds.

Cook engineers use the facilities of the Air Force Flight Test Center, Edwards AFB, Calif., for this specialized research and development work on parachutes.

▶ **Drop Tests—"Skokie"** is the name of a 32 ft. missile used in the drop tests. Loaded on a flight test Boeing B-29, modified to carry the strange shape, the missile is taken to altitudes of over 20,000 ft.

During the drop, three parachutes are opened from the missile tail fins. The fourth fin contains a highspeed movie camera which films the operation of the chutes.

At preset speed and altitude the first chute is popped. After a few seconds, a powder charge blows that chute clear, but during those few seconds, the camera and other instruments have been recording drag and stabilizing parameters.

The second chute blossoms right after the first is ejected, it is a drogue chute to slow the dropping missile to a point where the third chute can be opened for recovery of the bomb in good condition.

Final shock of impact with the ground is avoided by using a chrome steel spike, part of the missile nose. The spike penetrates the hard desert floor and, in doing so, absorbs the energy of impact. Instrument shock is avoided by this procedure, Cook reports.

During the drop, a tape recorder in the missile collects data which is reproduced later through a special unit developed by Cook. Output of the reproducer is a graphic reproduction of the collected data.

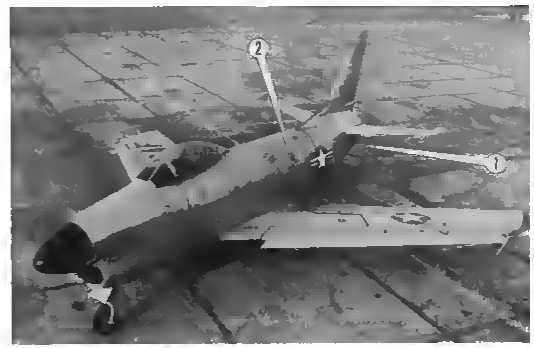
▶ **Sled Tests**—Cook engineers have developed one of the family of rocket-propelled sleds which hurtles down the supersonic railroad at Edwards (Aviation Week Sept. 7, 1953, p. 26).

Primarily used for collecting design data on drogue parachutes, the sled is instrumented in a similar manner to the drop-test missile.

Design speed of the sled approaches Mach 2, power for the rapid ride comes from North American Aviation's 50,000-lb. thrust liquid-propellant rocket engine.

The sled is stopped by using a water brake developed by Cook. The brake scoops water from a shallow trough between the rails and transfers the tremendous energy of the moving sled to the water.

Aviation Week Picture Brief



FLOW SEPARATION is delayed by use of vortex generators on F-86D Sabre.

Vortex Generators on F-86D

Flow improvement at two critical locations on the North American F-86D Sabre is the job of a group of tiny airfoil sections called "vortex generators." Purpose of the generators, which create a vortex pattern downstream of their location, is to re-energize the boundary layer air and delay separation of the flow from the surface.

This is the second reported use of the airfoils, the first is on the wings of the Boeing B-47 Stratojet (Aviation Week Nov. 9, p. 52).

Study of the pictures shows that two methods of construction are used. Ahead of the NACA flush intake, the generators are either simple angle clips or T section extrusions, riveted through the detachable panels in the vicinity of the intake (indicated by [1] on photo above). Under the tail and on the fuselage side, the generators are cut from sheet and welded to a strip which is in turn either riveted or screwed to the skin panel (indicated by [2] on photo).

T SECTION extrusions are riveted through panels at flush intake.

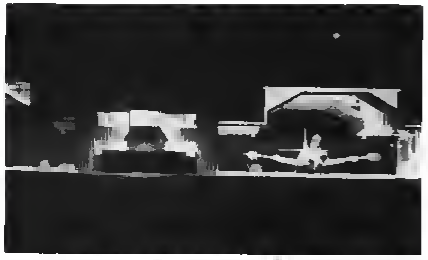
CUT FROM SHEET, generators are welded to strip riveted under tail.

Scramble!

This is how Air Defense Command races time when radar reports on unidentified aircraft.

1 IN READY ROOM, between alert hangars (photo below), pilots and radar observers wear flight gear while on duty so they can head for nearby planes without delay.

2 SCRAMBLE SIGNAL is flashed to ready room by base operations duty sergeant, seen receiving a call from nearby radar station reporting contact with an unidentified plane.

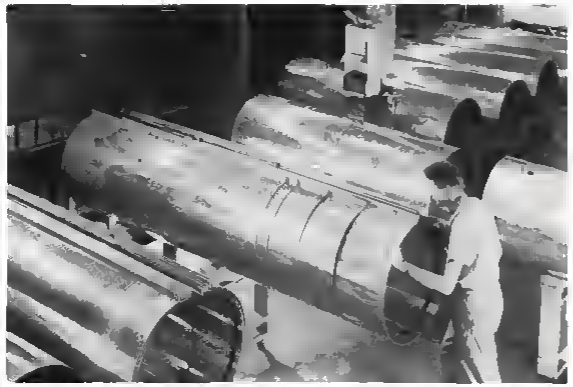


3 LOCKHEED F-94C STARFIRE interceptor stands ready in open hangar, fuel tanks full, rocket tubes loaded, portable engine starter (under right wingtip) plugged into place.

4 CREW SPRINTS to Starfire to strap pilot and radarman into cockpits and start P&WA J48 turbojet. Front and rear doors of alert hangar are raised electrically within 30 sec., enabling plane to taxi directly from its heated shelter onto paved ramp leading to runway with minimum taxiing.

5 ON THE RAMP, ground crew rushes to get another Air Defense Command F-94C ready to join its sister ships in the scramble. Planes are guided to target by ground radar.

6 TAXIING FOR TAKEOFF with Starfire's canopy closing over the cockpits. Air traffic has been diverted from the field to insure fast, uninterrupted takeoffs. "Enemy" turned out to be commercial plane off prescribed course. Alerts like these help AF polish interception techniques.



FIVE CENTER SECTIONS are nested, then wrapped around 10 nose or tail sections.

Ten Wing Tanks Take Space of One

A new packaging technique applied to wing tanks for USAF jet aircraft is designed to permit 10 tanks to be shipped and stored in the space normally occupied by one.

The technique effected a $325,000 saving in shipping and storage costs on one shipment alone, according to Royal Jet, Inc., Alhambra, Calif., which produces the tanks.

The packaging or nesting technique is accomplished in this manner:

Ten nose sections are fitted together, like drinking cups, and then wrapped in five center sections along with a drum of parts (nuts, bolts, etc.) for five tanks.

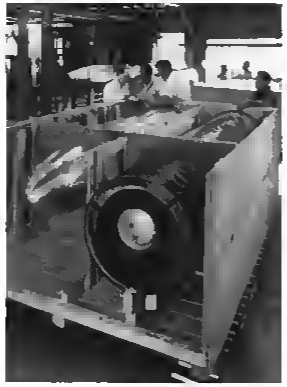
Ten tail sections are fitted together in the same manner and wrapped in five center sections along with another drum of parts for five tanks.

These two assembled groupings are placed in the packing crate.

Then, 40 seal rings and 20 channel rings are secured in the crate and the 10 completely packed wing tanks are ready for shipment.

When the tanks arrive at their destination, they are assembled with simple hand tools screwdrivers and wrenches.

Royal Jet, Inc., in collaboration with Century Engineering Co. of Burbank, Calif., designed, developed and manufactures the wing tank.



COMPLETED NEST contains 10 wing tanks, including nose, center and tail sections plus seal and channel rings and drum of nuts, bolts etc.

Aircraft Temperature Studies Simplified

A graphical method for determining skin and interior temperatures on high-speed aircraft at altitude has been developed by two scientists in the Research Division of the New York University College of Engineering.

Using this new method, aircraft temperatures can be calculated much more rapidly for conditions of flight up to Mach 5 and altitudes of 100,000 ft. During a year-long research period, project director William D. Murray and research associate Lawrence Slote computed stabilized skin temperatures, equipment temperatures, interior air temperatures, and atmospheric prop-

erties which would affect body heating and cooling

▶ Test Method—The two scientists have suggested a test method which will give results that they describe as more realistic and practical than any hypothetical analysis. The graphical analysis is also applicable to the study of the effects of elevated temperatures on mechanical performance of highspeed aircraft and missiles, and on fuel and interior equipment.

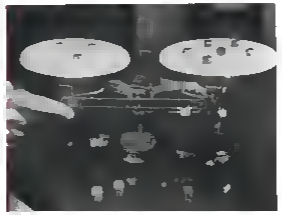
Basis for the analysis was a flat plate under conditions of isothermal surface and a constant free stream velocity. Conditions on the surface of an aircraft body are similar to those on a flat plate, said the scientists, except for the effects of disturbance from the aircraft nose and from fuselage curvature. The flat plate study can be applied to other surfaces with minor modifications.

During the course of their Air Force contract, the researchers confirmed the magnitude of the problem of aircraft surface cooling. For a typical example of flight at Mach 5, the amount of cooling required was calculated to be enough to cool a large building in a tropical climate.

Radiation No Worry To 'Mechanical Man'

There is one place where brawn can replace brain in nuclear engineering and that is where General Electric's new O Man comes in.

O Man, the approved nickname for



Scale Tips for Titanium

Six of its locknuts made of titanium alloy (right side of balance) weigh less than three standard steel units, says Elastic Stop Nut Corp. of America, Union, N. J. Thread size is the same in both types, and tensile strength specifications are met in the new titanium fasteners. Republic Aviation Corp., which is to get some of the initial production of the units, is quoted by Esna as saying that use of titanium in place of steel fasteners could save as much as 213 lb. in a fighter plane. The first nuts will be 12-point (double hex) style in sizes from ⅝ to 1 in., with nylon locking collars. Other types will be added later. For story on titanium dowel pin rivet, see p. 58.

Overhead Manipulator, is a steel strong man who can be remotely controlled and operated. The 15 ton giant can assemble or disassemble atomic engines in areas where radiation would make human operations impossible.

The manipulator was developed by the general engineering laboratory for GE's aircraft nuclear propulsion department, currently developing an atomic engine for aircraft under the sponsorship of the Atomic Energy Commission and the Air Force.

▶**Job Survey**—O Man is a versatile character, he can pick up heavy parts, position them and fasten them. He can drill and tap holes, use hammers, riveting guns, power wrenches, and even a metal saw.

In a recent demonstration of his versatility, O Man whipped up, sheed and served a cake.

In general, O Man possesses the same degrees of motion as the human wrist and arm, combined with the ability to telescope his forearm and to revolve his wrist.

He gets power from 140 separate wires in a multiple cable. Heart of the control mechanism is a system of eight amplidynes, a device developed by GE to provide automatic control with smooth operation and motion limitation.

PRODUCTION BRIEFING

▶**Douglas Aircraft Co.'s** El Segundo, Calif., Division has completed a $1.5 million hangar and flight test building at Los Angeles International Airport to house final installation work on F4D Skyray Navy interceptor production models.

▶**Pratt & Whitney Aircraft Division** of United Aircraft Corp. has completed a 168 x 152 x 40 ft. service hangar at Rentschler Airport, East Hartford, Conn. Plans call for a shielded radio lab in the hangar.

▶**Northrop Aircraft, Inc.**, Hawthorne, Calif., has granted an exclusive license to E. H. Stau Co., Los Angeles, to make and market a Northrop-developed anchor nut holder used in positioning and holding in place anchor nut plates prior to attaching the plates to plane structural parts. Northrop recently granted a license its leakproof, swivel elbow fitting to Peerless Mfg. Co. (AVIATION WEEK Nov. 30, p. 59)

▶**Mallard Industries, Inc.**, Stratford, Conn., is installing all electrical bombing systems, bombsights and electronically controlled tow targets in seven Douglas B-26 light bombers for the French Air Force. The FAF bought the planes from Eastern Aircraft Sales Corp., New York.

▶**Aerodex, Inc.**, Miami, Fla., has completed an executive aircraft terminal at 20th St., Miami International Airport.

▶**Kaiser Steel Corp.** is inaugurating an $8 million expansion program for its Fontana, Calif., rolling mills.

▶**Minneapolis-Honeywell Regulator Co.** has taken a six-month lease on manufacturing space at Tucson Municipal Airport, Ariz., to handle jet fighter electronic equipment.

▶**AiResearch Manufacturing Co.**, Los Angeles, Calif., has turned out 155,000-lb.-plus of Ni-Resist and stainless steels in first year of steel foundry operation. The firm added 75 new types of valves to its line in the past year, most of them using stainless steels.

▶**General Controls Co.**, Los Angeles, has dedicated a 120,000 sq. ft. plant in Burbank to house its Grayson-Greenmayer Appliance Controls Division.

▶**Young Testing Machine Co.** has opened a 5,000-sq. ft. plant in Bridgeport, Pa., for manufacturing precision weighing systems, grips and testing accessories.

WHAT'S NEW

New Publications

Bibliography of aircraft and airport fire bulletins, pamphlets and special notices, by title and price, is available from the National Fire Protection Assn., 60 Batterymarch St., Boston 10, Mass.

Sound Intensity Tests at the Proposed Detroit Northeast Airport Site is a report of tests taken on tape recorders of normal street traffic and extreme aircraft operation at the location of the proposed airfield, which showed that surface noises frequently surpass those of aircraft operation. The study was prepared by Smith, Hinchman & Grylls, Inc., architects and engineers, Detroit, Mich., for the Detroit Aviation Commission.

Civil Air Regulations and Reference Guide for Pilots, 1953 edition, is compilation of federal regulations covering all types of pilot certificates. Published by Aero Publishers, Inc., 2162 Sunset Blvd., Los Angeles 26. Price is $1.75.

Research on Near Accidents, No. 9, is an analysis of a study conducted for the Air Force by the American Institute for Research, Pittsburgh, to determine an effective system of reporting and analyzing information on hazardous incidents. Purpose of the study was to aid in accident prevention. A complete report on the study is available from the School of Aviation Medicine, Randolph AFB, Tex., under title of Project No. 21-1207-0001, Report No. 1, 1953.

The Human Factor in Accidents, with Special Reference to Aircraft Accidents, is another study made by the Institute for the Air Force School of Aviation Medicine, designated Project No. 21-03 No. 21-30-001, Report No. 1. This report that was formerly labelled "Restricted," has been declassified.

Telling the Market

Threading tool details are contained in Bulletin 110D from Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass. **Various types of chucks,** including regular-duty independent, universal and combination models are covered in Catalog 753 distributed by Westcott Chuck Co., Oneida, N. Y.

Horizontal metal-cutting bandsaws and special-duty saws for unusual jobs are detailed in 12 page catalog issued by Wells Mfg. Corp., Three Rivers, Mich. **Hole punching units** for piercing mild steel up to ½ in. thick are described in Catalog BL, sixth edition, available from Wales Strippit Corp., North Tonawanda, N. Y. The firm has also released Catalog DM, second edition, covering its de luxe and standard models of drilling machines.

Hex socket cap screws are subject of Bulletin 876, which also contains a price list of units. Write Bristol Co., Waterbury 20, Conn. **Precision rotary tables,** indexing to any angle within a few seconds of an arc, are detailed in a new catalog available from Pratt & Whitney, Division of Niles-Bement-Pond Co., W. Hartford 1, Conn. The firm is also distributing literature on its 2E Electrolimit jig borer. **Facts About Low Hydrogen Electrodes** deals with recent developments in the field, with chapters devoted to history, effects of hydrogen, effects of the basic slag, control of hydrogen, welding procedures and applications. Write to the Alloy Rods Co., York, Pa., and ask for their Bulletin AR53-18.

Aircraft seat belt Catalog 21b features complete line of M5100 belts with ordering and engineering data. Write Air Associates, Inc., Teterboro, N. J. **Semi-automatic butt welding machines** made by Solar—one for welding seams to 30 in. long and the other to 60 in. long—are described in brochure being distributed by Contracts Division, Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif. **Aircraft generator systems** are covered in two new GE bulletins. GEA 5906 details 28-v. d.c. systems; GEA 5905A describes a.c. systems. Write General Electric Apparatus Dept., Schenectady 5, N. Y.

Publications Received

- **Jane's All the World's Aircraft 1953-1954**—compiled and edited by Leonard Bridgman—pub. by The McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y.—378 pages—$23.00. Newest volume in this series provides data and pictures of all the world's aircraft.
- **Ideas and Weapons**—by I. B. Holley, Jr.—pub. by Yale University Press, New Haven, Conn.—$3.75—222 pages. Study cites war experience with airpower to show that administrative processes and formulated doctrines for the conversion and use of new weapons are mandatory for the United States.
- **Stress Concentration Design Factors**—by R. E. Peterson—pub. by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.—$8.50—155 pages. Work book on the making of strength calculations for machine parts and structural elements.
- **The Dynamics and Thermodynamics of Compressible Fluid Flow, Vol. 1**—by Ascher H. Shapiro—pub. by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y.—647 pp.—$16.00. Text on compressible fluid mechanics by a professor of mechanical engineering at MIT. Combines physical reasoning, theoretical treatment and applied problems.

Decca Produces $15,000 GCA Radar

- **Low-cost set combines PAR-ASR features.**
- **Maker pushes it for airport use, copter aid.**

By Philip Klass

Decca Radar Ltd. of London has announced a new low-cost surveillance-approach radar, the second 'poor man's GCA" to be announced by British firms within the past year. The first, made by E. K. Cole Ltd., is undergoing test in the U. S. as a possible helicopter landing aid (AVIATION WEEK Dec. 8, 1952, p. 59).

The new Decca Model 424 radar reportedly sells for less than $15,000 (uninstalled) compared to an uninstalled price of around $100,000 for a U. S. precision approach radar (PAR) or air surveillance radar (ASR).

Decca originally developed the GCA for landing jet fighters. However the company is now pushing its use for small and medium-sized civil airports and for helicopter instrument landing. Decca reports that it has sold a unit for installation at the Woolsington airport in England.

▶**Combined ASR-PAR**—The new GCA resembles our ASR in its hemispheric type coverage and its plan position indicator or PPI-type display. However, instead of operating in ASR's S-band (10 cm.), the new Decca set operates in X-band (3 cm.) to get better definition. From this standpoint it resembles our PARs.

The combination gives the Decca radar a useful range of up to 25 miles on large transports and up to 15 miles on smaller jet aircraft (having an effective reflecting surface of three square meters), the company says.

Because the set provides no information on the altitude of approaching planes, the letdown is made by reference to a barometric (or radio) altimeter.

▶**Decca-Ekco Comparison**—The new Decca GCA appears to have several operational advantages over the Ekco set, achieved at the expense of some increased complexity. These are:

- **PPI type display** in the Decca shows all aircraft in the area. The Ekco set uses an A-scope which cannot display surveillance information.
- **No manual tracking** of approaching aircraft is required. In the Ekco system the ground operator must align his antenna on the approaching plane and then must continuously track it in both azimuth and elevation.

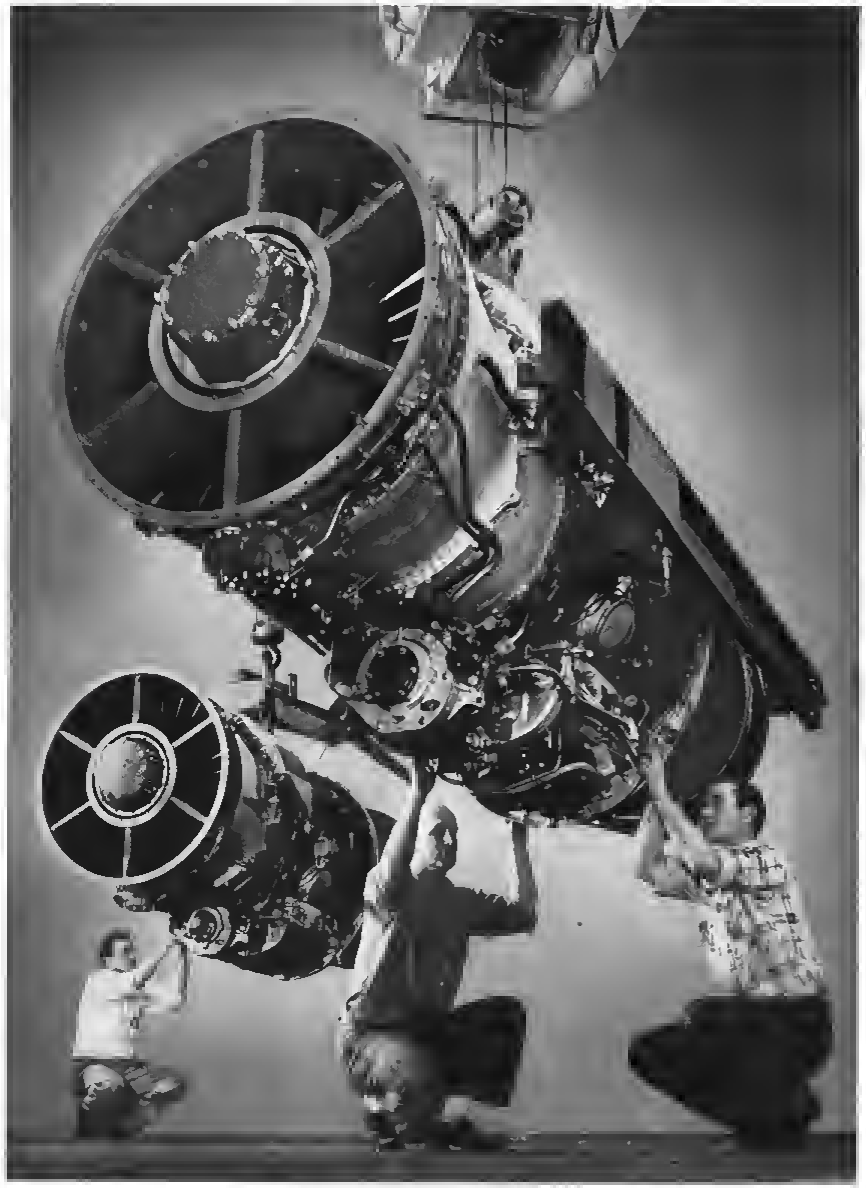
On the other side of the ledger, the Ekco provides information on airplane altitude which is not available in the Decca set.

▶**Packaging**—The Model 424 is available in three types of packages: one for permanent installation, another in air-transportable form for military use, and the third as a self-contained mobile unit in a 3-to-5 ton truck. The truck houses the complete radar set and antenna, as well as PPI scopes and positions for two GCA operators.

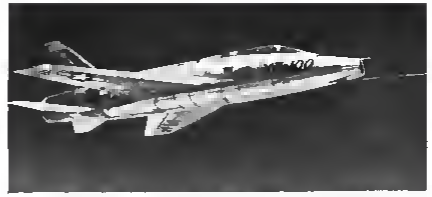
Decca says the mobile unit can be placed in operation within a few minutes after arriving at an airfield. The

LOW-COST GCA, developed by Decca Radar Ltd. of England, combines functions of surveillance and approach radar. Mobile unit shown houses

DUAL OPERATORS' STATIONS, equipped with 12-inch radar scopes, in addition to radar set and antenna. The scopes operate from independent receivers.



The J-57, in the 10,000-pound thrust class, is the most powerful turbojet engine now in production. A new generation of U.S. air power has been designed around this mighty new Pratt & Whitney Aircraft engine.



North American's F-100 Super Sabre, fastest Air Force jet fighter, is powered by Pratt & Whitney Aircraft's J-57 engine.

First all-jet heavy U. S. Air Force bombers are the huge Boeing B-52s, powered by eight J-57s mounted in pairs

The Douglas F4D Skyray, fastest Navy jet fighter, will be powered with the big J-57 engine

The Douglas A3D, the Navy's most powerful carrier-based attack airplane, has two J-57 engines.

Blazing the Way for a New Generation of Air Power

The most powerful turbojet engine in production is blazing the way for a whole new generation of American aircraft.

That engine is Pratt & Whitney Aircraft's J-57, the first turbojet to achieve an official rating in the 10,000-pound thrust class.

But the J-57 provides far more than extreme high thrust. Its unique Pratt & Whitney Aircraft design, achieved after years of intensive research and engineering, offers as well the low specific fuel consumption so vital to jet-powered bombers and future transports, plus the additional important factor of fast acceleration.

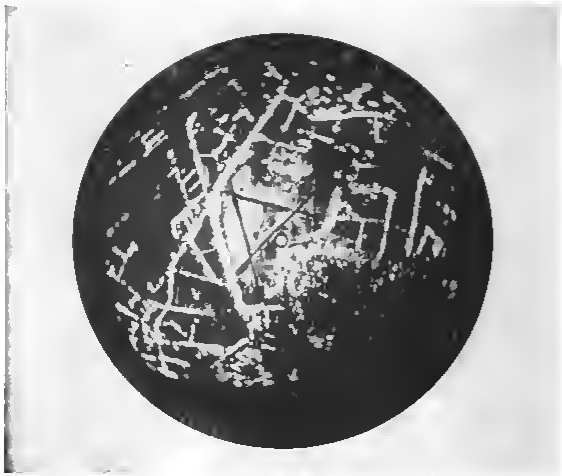
The importance of the J-57 in America's air power program is clearly shown by the fact that it is the power plant for three of the new "century series" fighters for the U. S. Air Force—North American's F-100, McDonnell's F-101 and Convair's F-102—as well as Boeing's B-52 heavy bomber. The Navy, too, has chosen the J-57 for its most powerful attack aircraft, the Douglas A3D, and for the Douglas F4D fighter. And the J-57 will power the Boeing 707 jet transport.

The J-57 is fully justifying the long years and intensive effort required for its development, providing pace-setting performance for a new generation of American aircraft.

Pratt & Whitney Aircraft

MAIN OFFICE AND PLANT: EAST HARTFORD, CONNECTICUT
BRANCH PLANTS: NORTH HAVEN, SOUTHINGTON, MERIDEN

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



AIRPORT RUNWAY SURVEILLANCE is possible by depressing antenna from its normal elevated position. Photo taken with range set for one mile.

unit need only be aligned and connected to a source of power and to radio communication circuits.

▶**Radar Display**—The two 12 inch radar scopes operate from independent receivers. This permits each operator to set his PPI for different operating ranges. When traffic density requires, one operator can set his PPI for 25 mile range for surveillance duty, while the other uses a 5 mile range for approach talk-down.

Each operator can select a range scale of 1, 2½, 5, 10, 15 or 25 miles. The display units have the customary controls including IF gain, brilliance, range switch, focus, a variable range marker, and off-center display.

▶**Comparison With PAR, ASR**—A comparison of some of the Decca radar performance characteristics with those of our own ASRs and PARs shows that the British set is a hybrid of the two. For example:

	ASR-2	DECCA	PAR-1
Power (kw)	260	32	22
Range (miles)	32	25	10*
Beam width (deg)	3.2	2.75	3.5
Scan rate min	20	24	120

*The PAR has greater potential range but only 10 miles is required.

Decca speaks of instrument approaches down to altitudes of 200-300 feet and to within half to three quarters of a mile from touchdown.

With the 424's low scan rate (compared to a PAR), a jet plane approaching at 150 mph will cover approximately 550 ft. between individual radar "looks" at the plane's flight path. Whether this "lag" between airplane movement and radar scope information is acceptable for high-performance jet aircraft in final approach is a moot point.

▶**Construction Details**—Decca achieves its narrow (0.75 deg.) beamwidth by means of a 14-ft. horn-fed parabolic antenna which gives a (vertical) beam height of approximately four degrees. The antenna can be elevated or tilted through an angle of 14 degrees by the operators in order to swap radar range for increased altitude coverage, or vice versa.

By depressing the antenna, the Model 424 can be used as a taxi radar to observe movement of aircraft on the ground. The set shows surprisingly good resolution as a taxi radar (see photo, above).

Mounted in a housing directly under the antenna and connected to it by a short waveguide are the radar modulator, magnetron, klystron mixer, and associated items. The set has a pulse repetition rate of 1,000/sec. Pulse duration is 0.1 microseconds at short range and 0.5 microseconds at long range. Decca says that side lobes are more than 33 db below the main beam.

Of Ohms and Farads

New resistors, capacitors, and potentiometers, suitable for avionic equipment, have recently been announced by components manufacturers. They include:

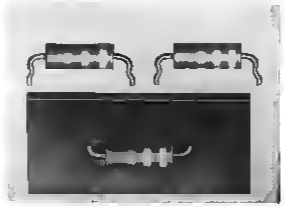
• **Power resistor.** New type of fixed wire-wound power resistor is made smaller and 25% lighter in weight by new process which imbeds winding in an integral ceramic core and coating. Unit is designed to MIL-R-10566, available in styles R-30, 33, 37, and 46, rated for hot-spot temperatore of 350C, in 8, 28, 125 and 225-watt ratng with resistance values of 100 to 160,000 ohms. Standard tolerance is 5%, with closer tolerances available. Shallcross Manuf. Co., Collingdale, Pa.

• **Precision film resistor.** Type MBC molded boron carbon, ½ watt, is designed to MIL-R 10509A. Plastic cover gives mechanical and moisture protection. International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.

• **Hermetic-sealed resistors.** Type PM, designed to MIL-R-93A, is available in six body sizes, with windings of Nichrome, Karma or Manganin alloys, with resistances to over six megohms. Manufacturer says that high temperature sealing compound has same temperature coefficient of expansion as wire and coil forms to prevent cracking. Instrument Resistors Co., 1036 Commerce Ave., Union, N. J.

• **Precision wire resistor.** Low-capacity unit designed for use in test equipment, computers, and other precision gear, has capacity controlled to 0.5 mmf, in a one-megohm resistor, manufacturer says. Eastern Precision Resistor Co., Richmond Hill 18, N. Y.

• **Printed wiring resistors.** Standard ½ watt fixed-composition resistors are available with specially formed and trimmed leads for use with printed con-



ductors and dip soldering techniques. Electronics Components Div., Stackpole Carbon Co., St. Marys, Pa.

• **Sub-min capacitors.** New series of high-capacitance, sub-miniature ceramic capacitors, is available in values up to 0.04 mf., 200 v. d.c., and up to 0.025 mf. rated for 500 v. d.c. Larger values may be had by stacking several units. Capacitance will not fall below 65% of room temperature value when unit is operated between —40C and 125C, manufacturer says. Mucon Corp., 9 St. Francis St., Newark 5, N. J.

• **Suppressor capacitor.** New series of high-current (50-amp.) feed-through capacitors for use in RF interference suppression. Designated Type 112P, units are rated at 250 a.c. working voltage, at temperatures of —55C to 85C. Sprague Electric Co., 327 Marshall St., North Adams, Mass.

• **Precision potentiometers.** Service life of up to five million cycles with relatively no increase in noise level or change in linearity under normal use is claimed by manufacturer. New type 756 is available with linear windings to a 0.25% tolerance and to 0.35% for non-linear windings with a 3:1 slope ratio in high resistance ranges. Units can be provided with up to 13 taps accurate to within one degree, company says. Fairchild Camera and Instrument Corp., Potentiometer Div., Robbins Lane, Syosset, Long Island, N. Y.

• **Linear potentiometer.** Tiny linear potentiometer designed to be coupled to low torque bellows or Bourdon tube actuating elements, is available with strokes of 0.05 to 0.3 in., 100 to 20,000 ohms, 0.25% or 0.5% linearity. Operating force required is eight grams maximum and size is ¾ in. dia. x ¾ in. long. Galetronics, Inc., 2607 F Foothill Blvd., Pasadena 8, Calif.

PAA Stripdown Cuts Zero Reader Weight

A stripped down version of the Sperry Zero Reader flight director, which cuts installation weight by 65%, volume by 50% and cost by 40%, has been devised by Pan American World Airways' Pacific Alaska Division without sacrificing important features of the device. The new version is being installed on the division's fleet of 15 Boeing 377 (AVIATION WEEK Dec. 7, p. 113).

The stripped down version is possible where an airplane is equipped with a Sperry A-12 automatic pilot, as are the Boeings. PAA decided to eliminate the Zero Reader's separate vertical gyro (and fast erector) by tying into the autopilot's vertical gyro.

ing cruise, PAA decided it did not need a constant altitude mode of operation in its Zero Reader, so out came the altitude-sensing element. By the time PAA had finished, it had cut the Zero Reader weight from 22 lb. to 8 lb. The primary, all important ILS approach function of the Zero Reader is not affected by the stripping-down process, nor is its constant heading, or constant attitude modes of operation.

Sperry engineers worked with PAA in engineering the stripped down version. PAA is currently buying only the electronic computer portion of the standard Zero Reader control, plus the panel indicator and heading selector.

Signal Generators Cover Wide Range

Signal generators, ranging from 2,500 mc. down to low-frequency sub audio, suitable for laboratory use have recently been announced. The devices are:

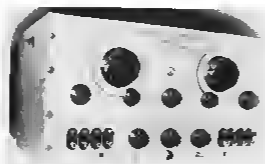
• **Low-frequency oscillator,** Model 420-C, provides sine or square wave voltages in the frequency range of 0.35 cycles to 52 kc. Maximum output is 30 v. peak to peak across a 1,000-ohm load. Krohn-Hite Instrument Co., 580 Mass. Ave., Cambridge 39, Mass.

• **UHF power oscillator,** capable of providing 50 w. power at 200 mc. and 10

w at 2,500 mc, has power output varying at frequencies between these two extremes. Provision is made for external plate modulation at either audio or video frequencies. Output impedance is 50 ohms. W. L. Maxson Corp., 460 W 34th St., New York 1, N. Y.

• **Audio sweep generator** is available in three different models in which the frequency of the output continuously sweeps over range of 20 to 200,000 cps, 2 to 20,000 cps, or 0.2 to 2,000 cps.

Device has internal sweep rate of 5 or



10 cps, either linear or logarithmic sawtooth. External sweep rates of 0.01 to 10,000 cps can be used. Technomatic Instrument Co., 2316 Pico Boulevard, Santa Monica, Calif.

Sensitive New Relays Include Radical Type

A radically new type of relay, which uses an electrostatic capacitive element instead of the familiar electromagnet, is one of three new relays recently announced.

This relay, the Capaswitch, requires only 0.5 milliwatt-seconds of operating power at 150 v. d.c. to close its contacts and less than 0.1 mw. to keep them closed. The electrostatic element can also be used to store tiny bits of energy from a low-energy source until sufficient has been accumulated to operate the relay. Input resistance is 100 megohms. Capacitance is 0.05 mf. Normal closing delay is 10 milliseconds, but device can be actuated element without damage, manufacturer says. Model A Capaswitch weighs 2 oz., measures 3½ in. long x 1⅛ in. wide x ⅞ in. thick and comes in a SPDT style with contacts rated at 1 amp., 110 v. a.c. non-inductive load. Manufacturer is Mullenbach Electrical Mfg. Co., 2300 East 27th St., Los Angeles 58, Calif.

The other new relays:

• **Miniature relay,** type 26P18, is actuated by a rotary high-torque motor. It comes in a nitrogen-filled hermetically sealed plug-in case. Manufacturer says it exceeds MIL-R-5757B requirements and operates under 10G vibration at 10-500 cps. Standard design is for 26.5-v. d.c. operation but relay may be had with coil resistances up to 19,000 ohms. Unit has a six-pole, double-throw arrangement, with contacts rated at 3-amp. resistive load, 1.5-amp. inductive load. Relay is also available in two-, three-, or four-pole, double-throw styles. Filtors, Inc., Electrosnipt Control Div., 30 Sagamore Hill Dr., Port Washington, L. I., N. Y., is the maker.

• **Super-sensitive relay,** style SS-1-O D., can be actuated by as little as 0.25 mw. Drop-out voltage to engage-voltage ratio can be adjusted over a wide range. Relay is available with 8,000- to 14,000-ohm coils. Contacts are rated at 2 amp., 110 v., non-inductive. It is made by Technifex Corp., Port Jervis, L. I., N. Y.

FILTER CENTER

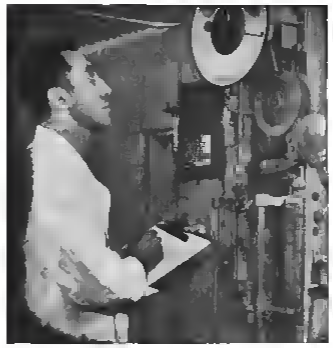
► **Alford Elected to RTCA**—Firm of Andrew Alford Consulting Engineers, Boston, which developed the Alford Slot Antenna for use in VOR and TVOR stations has been elected to membership in the Radio Technical Commission for Aeronautics. Company, which is active in the aviation radio aids field, also helped develop a dual localizer system for USAF.

► **Collins Forms Canadian Subsidiary**—Collins Radio Co. has formed a subsidiary, Collins Radio Co. of Canada, Ltd., with offices in Ottawa, to render technical assistance to Canadian manufacturers building to Collins' designs. Group will promote sale of Collins equipment, working with three of the parent company's present distributors, Canadian Aviation Electronics, Ltd., of Montreal, Technical Enterprises, Ltd., of Toronto, and Aertronic Agencies, Ltd., of Vancouver. Both Trans-Canada and Canadian Pacific airlines use Collins equipment throughout their fleets.

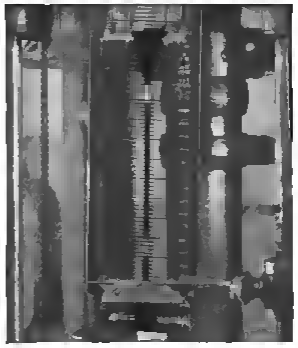
► **NBS Evaluation**—Recent report of group of noted scientists formed to

Look how Parker O-ring compounds have earned acceptance for all military applications

1. Over 800 Parker compounds have been developed to meet your individual O-ring and custom-molded rubber requirements. Just *any* compound won't do the job. Parker checks your specifications to see which compound is best. If one can do the job, we'll formulate and mix (shown above) a special compound to solve your individual problem.



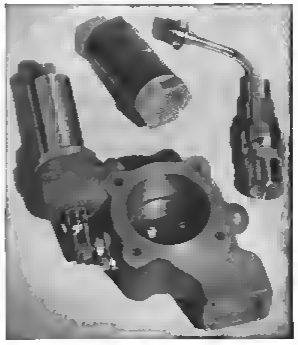
2. Tensile strength is one of the many specifications that each Parker O-ring compound must pass. Other tests prove resistance to both tear and abrasion.



3. Elongation, being tested here, and maximum compression set are other vital factors that determine which compound will assure leakproof O-rings for your application.

4. Fluid and temperature tests help assure long life of Parker O-rings. Compounds are checked for resistance to oil, fuel, or chemicals at high or low temperatures.

5. Prove for yourself that Parker O-rings are right for your specific application. They're economical to use. And they help designers save weight and space!



6. What other Parker products for aircraft applications interest you? We build jet-engine accessories (shown above) for engine *fuel, hot-air* and *hydraulic systems.*

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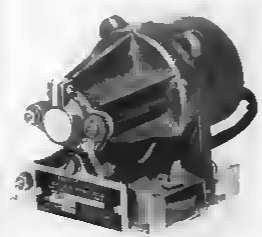
Parker
Hydraulic and fluid system components

evaluate functions and operations of the National Bureau of Standards calls it "surprising" that NBS Electronics Division is not doing any work on transistors, in view of its work on miniaturization of electronic equipment. The report recommends setting up a group on vacuum tubes and transistors which will devote itself to standardization, reliability, testing, and standards on a national basis.

► **Avionics Bulletins**—Recently announced publications of interest to the avionics field include the following:

- **Plug-in unitized design handbook,** entitled "Ideas Techniques-Designs," describes a variety of plug-in packages and basic chassis for unitizing avionic equipment to permit rapid maintenance. Handbook contains more than 100 pages, is well indexed and divided for easy access. Requests for copies, on company letterhead, should be made to Alden Products Co., Dept. HB, Brockton, Mass.
- **Oscillograph,** general-purpose Type PM-10, for laboratory testing, is described in 12-page bulletin GEC-449B by General Electric Co., Schenectady 5, N. Y.
- **Buyers guide** and reference manual for electronic parts and equipments, a 216-page handbook, is available from Dale Electronic Distributors, 150 James St., New Haven 13, Conn.
- **Junction transistors,** of the n-p-n grown-junction type, are described in tentative specifications available from manufacturer, Federated Semi-Conductor Co., 66 Dey St., New York 7, N. Y.
- **Hermetic-seal terminals,** in a variety of sizes and types, are described in Bulletin 949-A, available from Electrical Industries, 44 Summer Ave., Newark 4, N. J.

—PK



Regulates Voltage

New voltage regulator, cathode-pile type, for use with 28-v. d.c. aircraft generators, has been announced by General Electric's Specialty Control department. Weighing less than 3 lb., new regulator will return line voltage to within 10% of rated value in 1/10 sec. after application or removal of full load. Unit has plug-in type mounting provisions and can be installed in a GE center-of-gravity type vibration mount, designed to Navy BuAer spec. 17R21.

Martinliners Boost SWA Business

The four Martin 2-0-2s which Southwest Airways purchased recently from Transocean Air Lines are making money for the airline and boosting its DC-3 payloads as well. They have increased the carrier's load factors, generated more passengers and more dollars.

John H. Connelly, SWA's president, makes these claims in a letter addressed to the heads of 13 other local service airlines throughout the country.

▶First Four Months—The letter transmits statistics for the first four months of Martinliner operation and compares its payloads and costs to the DC-3s Southwest operates along its routes from southern California to southern Oregon.

Here are some of the figures and the conclusions drawn by Southwest:

• Increased load factors. Martinliner load factors climbed steadily from 55.7% in May, first month they operated, to 63.1% in August. In the same period, DC-3 load factor climbed from 52.9% in June to 62.9% in the month of August.

Connelly states: "The high load factors were not achieved through scheduling the Martinliners on the best flights only, as we purposely experimented during this period by switching the Martinliners around to various flights. The results were always the same—wherever the Martinliners were scheduled, those flights developed high loads, and in addition, the flights that reverted back to DC-3s did not lose completely all the gains achieved while they were Martinliner flights."

• More dollars. In August, Martinliners flew 70,855 scheduled miles and generated passenger revenues of $88,795. In the same period, the DC-3s flew 118% more miles but generated only 27% more dollars than the Martinliners.

• More passengers. Southwest figures show that during March-May 1953, there was no growth in traffic over the corresponding months of 1952. However, in June-August, the second-to-fourth months of Martinliner operation, traffic jumped 10.32%, 20.60% and 9.70% respectively over the same three months of 1952. Connelly at

tributes this increase entirely to introduction of the 2-0-2

• **Troublefree.** Connelly says that the Martinliners have proved to be unusually troublefree from a maintenance point of view. Costs have dropped steadily until they "are now approaching TWA's 2 0 2 maintenance costs." Martinliners suffer very few mechanical delays, Connelly says

Average time at the blocks is 3½ min. for the 2-0 2s and 2½ min for the DC-3s

Liquid-Fuel Unit Starts Turbojets

Details have been released on Plessey's mono-propellant turbine engine starter that is completely independent of outside power sources. United Aircraft Corp.'s Hamilton Standard Division has the license to produce these liquid-fuel-powered units in the U S (AVIATION WEEK Dec. 8, 1952, p. 74).

Two sizes of the same basic isopropyl nitrate fuel system have been designed

• **LTS 150.** For engines requiring average starter power of 150 hp. and peak output of 300 hp

• **LTS 70.** For engines requiring 70 hp. starting power and 140 hp. peak output

Available in adequate quantities at low cost, isopropyl nitrate is a monofuel which does not require air to burn or produce energy. It therefore permits use of the simplest and lightest pumping and control systems

The starting sequence, automatically controlled, is activated by a pushbutton in cockpit.

• Air is supplied from the pumping unit to the combustion chamber for scavenging.

• Fuel is delivered.

• The resulting air-fuel mixture is ignited by spark plugs energized by a high frequency ignition unit

• Ignition is switched off and air supply is diverted.

• Fuel decomposes as a mono fuel until the engine reaches a predetermined speed, at which the system automatically is shut down. (Automatic shutdown also occurs in overspeed, failure to light or flameout.)

Use of isopropyl nitrate reduces the cost per start for engines in common use today to approximately four shillings (56 cents), as against 25 shillings ($3 50) in the case of cordite cartridge starting units. With larger engines being developed, estimated cost for cordite starting would be $14, whereas the new liquid fuel apparatus would cost only seven shillings, the British manufacturers says

With multi-engine aircraft, the intrinsic flexibility of a liquid fuel can be increased further by fitting each engine with a separate starting motor and using a common pumping and control system with arrangement made to switch each engine on in turn.

OFF THE LINE

Contract to manufacture all Boeing Stratocruiser passenger and berthing chairs has been signed between Boeing Airplane Co. and Hardman Tool and Engineering Co., the latter firm announces. Hardman will also be exclusive stocker of spares and parts for these seats. Address: 1845 South Bundy Dr., Los Angeles.

Van Dusen Aircraft Supplies recently opened its fourth branch—this one at Beacon Field, Alexandria, Va., near Washington National Airport. The facility will carry stocks of equipment for airline, corporate and private type aircraft.

Airwork Corp., Miami, has been appointed distributor for Page Steel and Wire Division of American Chain and Cable Co. The Miami company will stock stainless steel and zinc-coated safety wire for aircraft use.

NEW AVIATION PRODUCTS

Titanium Fastener Developed

Design of a successful production fastener made of high strength titanium alloy has been revealed by the Hi-Shear Rivet Tool Co., Los Angeles.

The fastener, a modified dowel pin rivet, was developed by Hi-Shear and Emmc Bergere, chief production engineer of the Douglas Aircraft Co., Long Beach Division. It is designed for use in aircraft or other structure applications where high temperature-resistance, low weight, high shear strength and anti-corrosion characteristics are prime factors of design.

Bergere believes that use of titanium fasteners may surpass by three or four times weight savings now being realized on aircraft through other uses of the new metal.

He points out that 'use of the new titanium fastener on the Douglas C-124 transport would result in an approximate savings of 800 lb. in areas where high shear strength is of prime consideration and tension a secondary load."

Hi-Shear plans to label its new titanium fastener the "Ti-Shear." The company reports that its production schedules and costs are subject to the availability of the titanium material itself.

The Ti-Shear fastener consists of a titanium pin, with the conventional Hi-Shear groove on each end and two 24ST aluminum alloy collars. The pin has a collar "set" on one end to create a manufactured head. After the pin has been inserted into the structure hole, a second collar is driven onto the protruding pin end in the conventional manner, eliminating the need for special tool sets. Pin diameters range from 3/16 to 1/2 in. and grip lengths from 1/16 to 8 in.

Test pins were made from rod furnished by Mallory-Sharon of induction-melted MST 3AL-5CR, an alloy of 3% aluminum and 5% chromium, which was turned, grooved and cut off in a screw machine. The manufactured collar was then attached in a special fixture.

Test work conducted by Bergere at Douglas using two 1/2-in.-dia. titanium pins, combined with 24ST collars, in two 1/2-in.-thick 75ST-6 plates, developed in single shear a minimum of 123,000 psi ultimate shear strength in 12 tests. Additional tests using 1/2-in.-thick heat-treated chrome-moly steel plates show shear value minimums of 126,000 psi.

These test results show a possible 55% saving in weight-strength ratios, compared to the MIL 20006 bolt, nut and washer, the company reports.

Also under Hi-Shear design consideration is a stainless steel collar to improve the Ti-Shear fastener heat resistance. Preliminary tension tests with 1/2-in.-dia. pins showed a minimum ultimate load of 4,950 lb., and with 3/4-in.-dia. pins, 11,250 lb., slightly better than AN bolt standards. Titanium collars are also being studied.

Hi-Shear Rivet Tool Co., 8924 Bellanca Ave., Los Angeles 45, Calif.

High Capacity, Low Weight Claimed for New Battery

New lightweight aircraft battery, known as the Rebat Flyte-Weight, is being put on the market by Reading Batteries, Inc.

Designated Model R3151, the 24-v units were specifically developed as replacements for all Beech D18 models and other AN3151-2 type applications.

Wet weight of battery is 47.5 lb. Manufacturer claims high capacity with up to 6 lb. less weight than comparable batteries.

Other features claimed are a light weight case which is said to offer high resistance to impact, higher capacity-to-weight ratio, and elimination of corrosion problems.

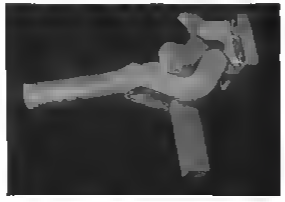
Unit conforms to standard exterior dimensions, but is said to have more interior space for battery elements. It meets capacity requirements of AN specification MIL-B-6147 and uses military-type oxides.

Capacity is given as 24 amp.-hr. at 5-hr. rate, 22 amp.-hr. at 2-hr. rate and 117 amp. at 5-min. rate.

Reading Batteries, Inc., Reading, Pa.

Heavy-Duty Cam Clamp Holds Working Stock

Cam clamps which are said to maintain positive holding pressure and secure holding action on varying stock



thicknesses are being offered by Special Engineering Service, Inc

Known by the trade name of Sesco, these clamps eliminate need for adjustment of hold-down bolts. Cam surface automatically makes allowances for stock thickness variations up to ¼ in.

Construction is steel. All working surfaces are machined to close tolerances and hardened. Heavy construction and precision assembly, along with cam feature, reportedly permit clamps to withstand severe vibration, making them suitable for milling as well as the usual clamping operations.

Units come in four sizes.

Special Engineering Service, Inc., 8161 Livernois Ave., Detroit 4, Mich.

High-Temperature Grease Has Military Applications

Standard Oil of Indiana announces development of a new type grease which reportedly will lubricate bearings at high temperatures for longer periods than any other known grease.

Specifically developed for Air Force, grease has passed tests of over 500 hr. at 450F. Manufacturer states that it will go up to 600F for short periods of time, and will also lubricate at temperatures as low as −40F, making it suitable for most military aircraft operations.

Base of the product, known as Super mil ASU grease, is silicone oil which is thickened with aryl-substituted ureas. Standard states that this thickener was chosen for its stability and high melting point.

Product will be marketed in 1- and 10-lb. tins. Price is relatively high, in accordance with high cost of manufacture, notes Standard.

Standard Oil Co. (Indiana), 910 South Michigan Ave., Chicago 80.

Test Equipment Measures Cabin Pressure Leakage

Availability of new equipment for testing pressurized cabin leakage is announced by Engineering Associates.

The set features direct-reading measurement of externally supplied airflow into aircraft cabin, says the maker. At equilibrium conditions this airflow rate is equal to the leakage rate.

The equipment is available in two models—a mobile test stand unit for production line use, and a portable unit for field service work.

A new type airflow meter is said to provide fast, positive, direct reading of airflow measurement data. Meter indicates cabin leakage on a single indicator, eliminating necessity for calculations, charts or skilled operator, says Engineering Associates. Any flow rate range can be provided, limited only by the capacity of the external source.

Engineering Associates, Burbank, Calif.

Miniature Roller Bearings Take Heavy Radial Loads

Landis & Gyr, Inc., announces availability of line of miniature roller bearings in three types and seven sizes.

Designated RMB Types N, NU and NP, these are said to be the first miniature roller bearings commercially available in the U.S. They are especially suitable for use in machines and motors where shafts are subject to heavy radial loads. All three models permit some axial displacement of shaft.

Roller assembly is retained by a snap ring on the inner race and section of shield on the outer race. Construction eliminates necessity of lip on either raceway, permitting production of cylindrical race with good finish on rolling surface.

Type N permits free axial displacement of shaft, easy removal of shaft, inner race and roller cage as a unit. With type NU the inner race remains on shaft and outer race, rollers and roller cage may be removed as unit.

Outer and inner races are permanently assembled on type NP, permitting location of shaft axially if axial stresses are slight.

Landis & Gyr, Inc., 45 W. 45th St., New York 36, N. Y.

LETTERS

Ryan's Trainer

My congratulations to the Ryan Aeronautical Co. and then G. C. Danch on the well studied argument for a side-by-side flight trainer, as presented in AVIATION WEEK Nov. 30.

From my own experience as a WW II advanced single-engine flight instructor in the North American AT-6, I feel that they can rest assured of the support of most, if not all, instructor pilots experienced in tandem-design trainers. Although many hours of experience in the back seat of a tandem trainer do result in a high degree of instructor proficiency in this mode of operation, the inherent basic deficiencies of the design are insurmountable and constitute additional sources of danger in an already hazardous occupation.

The reduction of instructor tension in the side-by-side trainer as a result of his improved command of the situation is, to me, the primary and most real improvement in the design change. This factor alone should so improve the instructor's performance as to overweigh nearly any argument opposing the arrangement.

My sincere regards and best wishes to the designers and builders of the Ryan Model 72 for this step in the right direction.

ARTHUR M. HOCKETT
Flight Test Engineer
Boeing Airplane Co.
Wichita, Kan.

Air Transport Series

We would like to have permission to reproduce "Income Changes Make New Travel Market," third of a series of six articles on Air Transport Markets in the Next Ten Years, in AVIATION WEEK Nov. 23.

ELMER P. THOMPSON
Director of Information
Air Transport Assn. of America
Washington 6, D. C.

I have read with great interest the first three articles on Air Transport Markets in the Next Ten Years. They certainly seem to be a worthwhile contribution to the air transport industry literature.

RICHARD H. AIMI
Manager, Passenger Tariffs
Trans World Airlines, Inc.
New York, N. Y.

Private Pilot Speaks

W. B. Young's letter (Let's Have Vigilance!) in the Nov. 9 issue is enough to make a statistician weep. It is about like saying that men have more auto accidents than women, therefore women drivers are more careful than men, and totally disregarding the fact that there are many more men drivers than women.

The facts are that there are 75 private planes to every airliner in view of which the ratios are just about what they should be, presuming an equal amount of reck

lessness in each category

Two other factors apparently cancel out • The far superior cockpit visibility of the average private plane

• The far denser private plane traffic since 95% of private flying is VFR, 50% is on Sunday afternoons, and about 25% is in the immediate vicinity of airports

W M Lightbowne President
Morristown Flying Club
Morristown N J

L.A. vs. N.Y.

I feel constrained to take issue with the article in your Nov 16 edition relating to the size of the California aircraft industry

No doubt of your figures and the fact that the aircraft industry is tops in California, but it has always been our contention that in spite of its pre eminence among its immediate industrial neighbors, the Los Angeles aircraft industry is second to that of Greater New York Because of the huge amount of industry in the Greater New York area, the aviation industry as such, looks smaller—but that's purely relative—and if we were to use that basis it's quite likely that Wichita would be the "undisputed air capital of the world"

We offer that on any basis other than pounds of airframe produced, Greater New York is the air capital of the world

One of the Aircraft Industries Assn's prime arguments was the employment figure at six Los Angeles plants While on the whole these firms are undoubtedly larger individually than any in the New York area, the total aviation employment in this area will far outstrip their figures As an example, let us total

Curtiss Wright	26,500
Fairchild	7,500
Grumman	13,000
Three N Y Port Authority Airports	19,000
Sperry Gyroscope	18,000
Republic Aviation	26,000
United Aircraft (Hamilton Standard, Sikorsky and Pratt & Whitney)	49,000
Eclipse Pioneer	9,200
	170 200

Not only is this a larger figure, but it is constituted from plants which give a more well-rounded picture of the aircraft industry Certainly the "air capital" should represent all facets of aviation We don't want to leave this figure without mentioning a cushion of reserves we haven't called on in the form of more than 800 firms engaged in aviation in this area (ignoring airlines and airfreight forwarders) including such heavy employers as Bridgeport Lycoming, Liberty Products, REF, BH Aircraft Avien, Arma, Kollsman, Servomechanisms Greer Hydraulics, Airborne Instruments, etc.

There's another aspect to this "air capital" business which we mentioned before and that is the need for a well rounded capital We'd like to call attention to the travel and traffic pouring through Greater New York's 60 airports

We have checked a recent copy of the Pacific Coast directory and find that in Riverside, San Bernardino, Orange and Los Angeles Counties (which look to be a com

parable physical area to that of Greater New York) there are only approximately 45. And, as you know, if there's one thing on which the West has always prided itself, it is the facilities for the private flyer.

I believe it's an established fact that the Greater New York market is the only market wherein an aircraft can be built and flown without the builder leaving the area for so much as a bolt. Naturally, present-day military aircraft are often dependent on electronic accessories made elsewhere, but the actual building and flying of an aircraft, per se, can be accomplished without leaving a 50 mile area based on Times Square.

We of Greater New York are proud of the size and ability of our aviation industry and feel we have suffered at the hands of California and Texas Chambers of Commerce long enough. If there is to be an "air capital of the world," we believe it should be Greater New York.

PAUL W. SPEIER, Publisher
Aviation Business Directory of Greater New York
New York, N. Y.

Turboprop's Friend

I have read with great interest the many articles concerning the development of the turboprop engine that have appeared in your magazine. However, a recent letter, entitled "Turbo Propaganda," has given me a shock. Propaganda indeed!

Does Mr. S. E. consider factual reporting propaganda? Will aviation benefit from fictional comment such as that contained in Mr. S. E.'s recent letter? The gas turbine engine at present is like an untrained horse in the stable. True, someone must develop the methods of hitching this horsepower to an airframe.

Mr. S. E. states that future passenger transportation should be turbo-jet propelled. His statements are provocative, but unrealistic and he fails to indicate who is going to pay the check.

Mr. S. E. states that the torque producing gas turbine is, by nature, extremely complex, therefore, expensive to develop. This statement is undoubtedly true. The turboprop engine, by itself, is more complex and more expensive than the turbojet. The question is—should we ever consider an engine—any engine—strictly by itself?

We know that, for all-out turbojet performance, close tolerance airframe manufacture is mandatory. Discounting all other factors, higher construction costs mean a much larger initial investment to the airline operator. To pay off this larger initial cost the airline executive might demand tangible evidence indicating a greater pay load, or reduced operating cost, or possibly an extended airframe life expectancy.

The problems encountered with turboprop engine shafting, speed reduction, clutching, fuel control, etc., are new to the industry. Because of military expediency in the past 15 years the engineering man hours allotted to turbojet research has exceeded turboprop research a thousand-fold. The aviation industry has not let one obstacle, or for that matter a hundred obstacles, interfere with the development of the turbojet engine.

Surely Mr. S. E. will agree that had a

traction of that time been devoted to the development of the turboprop, we would now have an efficient, highly developed torque producing gas turbine unit.

Would the airline operator be justified in considering the use of a proven turboprop engine? Certainly! For this reason: A modified present day airframe fitted with a turboprop engine would offer the airline operator a favorable operating margin of profit. This turboprop modification would cost one third of the price of an untried turbojet aircraft.

What would the airline operator have after this modification? Mr. S. E. states "the clinching argument for the passenger and the turbojet is the over the weather comfort factor." This might be a factor to the 25% of airline passengers who fly distances of 1,000 to 1,500 miles. But what of the remaining 75%, the passengers who fly short hops, 100 to 1,000 miles? It just might be that they enjoy the scenery on the other side of the bill boards.

One other point: A fully loaded turbojet aircraft consumes considerable fuel at low speeds and altitudes. A turboprop, on the other hand, uses much less fuel. Will the airline operator with short, medium and long routes maintain a fleet of specialized aircraft?

In my opinion, the best interests of the aviation industry will be served if the pursuits will restrain themselves a bit. The public he should not be led to believe they will be traveling in delta wing, supersonic airliners next year at fares comparable to those in effect today.

Until research brings forth shrouded propellers, ducted fans, or other devices, we must steel ourselves to the sight of weighty propellers, flailing the air to propel our gas turbine-powered airliner from point A to point B.

RICHARD F. RIEGER
6847 Gliddon Ave.
San Diego, Calif.

High-Tension Lines

The undersigned is collecting as many instances as possible where means have been adopted and used to mark high tension electric lines to make their presence known to pilots, particularly for daytime flying.

If you know of any such instances, will you please inform the undersigned.

ARTHUR BERMAN
P. O. Box 1177
Harrisburg, Pa.

Praise

Mr. E. H. Miller of our Instruction Book Section has suggested that I contact you to obtain reprints of your article "F86 D Flies with Automatic Engineer," which appeared in the Sept. 21 AVIATION WEEK.

Our engine control unit would like to have a dozen copies of the article. We think it gives a brief and clear description of the system and would like to have these copies available to acquaint others with engine controls.

PHYLLIS FLATTERY
Instruction Book Section
A&OS Division,
General Electric Co.
Schenectady, N. Y.

AVIATION SAFETY

Civil Aeronautics Board Accident Investigation Report

Icing Suspected in DC-4 Crash

THE ACCIDENT

A Douglas DC-4 aircraft N 88942 owned and operated by Transocean Air Lines, crashed in a field near Alvarado, Calif., at approximately 1838,[1] May 20, 1953. All of the 35 occupants including the crew of five were killed. The aircraft was demolished.

HISTORY OF THE FLIGHT

Transocean Air Lines' Flight 942 of May 20, 1953 departed Roswell, N. M., at 1211 for Oakland, Calif. On board were 30 military passengers and a crew consisting of Capt. H. E. Hum, First Officer F. W. Patchett, Chief Pilot H. W. Rodgers and Stewardesses V. Saodridge and L. Chapman.

The flight was for the purpose of transporting military personnel in accordance with the company's contract with the United States Department of Defense. Prior to departure a DVFR (Defense Visual Flight Rules) flight plan was filed with ARTC (Air Route Traffic Control), indicating a flight to be flown at an altitude of at least 500 feet on top of clouds via Red Airway 66 to Albuquerque, N. M., Green Airway 4 to Palmdale, Calif.; Blue Airway 14 and Amber Airway 1 to Bakersfield, Calif., Amber Airway 1 to Fresno, Calif., and Blue Airway 10 to Oakland, Calif.

There was sufficient fuel on board for 10 hours and the flying time to Oakland was estimated to be six hours and 35 minutes. According to the company's records the gross weight of the aircraft at the time of takeoff was 63,817 pounds, which was within the allowable gross weight of 73,000 pounds, the load was properly distributed.

After departing Roswell the flight progressed in a routine manner and at 1451, when in the vicinity of Winslow, Ariz., the DVFR flight plan was changed to IFR (Instrument Flight Rules), still at least 500 feet on top of clouds.

At 1732 the flight reported that it was over Fresno, Calif. at 1730, that it was cruising at 8,000 feet (at least 500 feet on top of clouds), estimating Los Banos, Calif. at 1740 and requested further clearance. At 1744 Flight 942 called the Fresno radio communications station and asked that the requested clearance be expedited, stating that it was now at 7,000 feet, at least 500 feet on top. At 1747, the following clearance was issued the flight: "ARTC clears Transocean 942 to the Newark radio beacon, maintain 8,000, contact Oakland Approach Control after passing Evergreen, no delay expected, report reaching 8,000." Approaching Evergreen at 1809, the flight was advised to maintain 8,000 feet to Newark. One minute later, at 1810, Flight 942 reported over Evergreen at 8,000 and requested a lower altitude. This request was denied because of traffic at the 7,000-foot level.

At 1819 the flight reported over the Newark, Calif., compass locator and fan marker (radio beacon) at 8,000 feet where it held for 11 minutes. At 1827, Oakland Approach Control cleared Flight 942 for a straight-in range approach, to descend in the holding pattern to cross the Newark compass locator at 3,500 feet and to report leaving each 1,000-foot level. Three minutes later at 1830, the flight reported leaving 8,000 feet and subsequently reported leaving each 1,000-foot level. At 1836, it reported being at 3,500 feet leaving the Newark compass locator inbound. This was the last known radio contact with the flight.

At approximately 1838 the aircraft crashed in a barley field. Impact and fire destroyed the aircraft. There were no survivors.

The Oakland weather reported at the time was: Measured ceiling 1,300 feet broken, 1,800 feet overcast, light rain, fog, visibility two and a one-half miles, wind south-southwest 17 miles per hour, altimeter setting 30.09.

INVESTIGATION

Investigation revealed that the aircraft crashed in a large flat field located three miles on a magnetic bearing of 323 degrees from the Newark compass locator and one and one-half miles northeast of the town of Alvarado, Calif. The surrounding terrain consisted of flat farm land on which were a few scattered houses, fences, and trees. The elevation of the field is approximately 17 feet MSL (mean sea level).

The aircraft first struck the ground on its right wingtip and with the wing in a near vertical position, then cartwheeled and disintegrated. Wreckage was scattered over an area approximately 800 feet long and 300 feet wide. Due to impact forces and the resultant fire, the aircraft broke into numerous small pieces, many of which were destroyed by fire with only two large sections of the aircraft remaining after the crash. These were the fuselage center section with a portion of the left wing attached which was found lying inverted approximately 634 feet from the point of first impact and the rear section of the fuselage, including empennage, from approximately Station 660 rearward to the tail cone, which was also lying nearby.

The many pieces of wreckage were care-

[1] All times referred to herein are based on the 24 hour clock and are Mountain Standard until the aircraft reached Fresno, Calif., and from this point on the times are Pacific Standard.

fully examined and the major structural components including the flight control system were laid out in a manner to reproduce as closely as possible their original positions in the aircraft. This detailed examination revealed that no portions of the aircraft's structure failed prior to impact and that a structural failure or fire in flight had not occurred. No evidence of fatigue failure was found in any of the many fractures examined. All breaks appeared to have been caused by impact forces, with considerable ductility evident in all of the fractures.

There was no evidence to indicate failure or malfunctioning of the primary control system.

▪ The right aileron was broken into five sections at impact. The breaks occurred through the hinge cutouts at Stations No. 421, No 557, No 613, and No 675. All hinges moved freely and there was no indication of pounding or rubbing. The left aileron separated into two sections at approximately Station No 613, and the inboard section from this station to Station 339 remained attached to the wing panel. All hinges on the latter section of the aileron were free to move.

▪ The vertical stabilizer tip was broken off through its attachment to the stabilizer. The rudder was also broken off at the same location. Otherwise, the rudder and vertical stabilizer were in good condition with the rudder hinge brackets free to move.

▪ The right horizontal stabilizer and elevator surfaces were broken just outboard of the center hinge. Both front and rear spars of the stabilizer were torn loose from the skin from the break to the tip joint. The top and bottom skin in this area was still attached to the tip. The outboard hinge was still attached to the elevator. The top and bottom bolts attaching the hinge bracket to the stabilizer spar on the inboard side of the hinge appeared to have failed in tension. However, the top and bottom bolts on the outside of the fitting of the hinge were still intact, and had pulled away from the surface together with sections of the top and bottom spar cap, and the attachment fittings on the forward side of the spar. The outboard end of the right hand elevator was bent to the rear at the outer hinge. The elevator trim mechanism in the right-hand elevator operated satisfactorily.

▪ The left hand stabilizer and elevator were broken just outboard of the center hinge. The front and rear spars of the stabilizer outboard of the break were torn out of the surface, and the section was generally demolished. The outboard hinge was attached to the rear spar of the stabilizer, and had become detached from the elevator due to the elevator hinge fitting being pulled loose at its attachment to the elevator structure. The center elevator hinge was still attached to both the stabilizer and the elevator. The left-hand elevator was also broken through the outer hinge. The left hand elevator trim mechanism operated satisfactorily.

▪ The right aileron trim tab was in the "neutral" position. The needle of the pilot's aileron trim tab position indicator, however, was positioned at the extreme left wing "down" position. This pointer was bent and the wheel mechanism was also bent and immovable. The rudder trim tab setting was 10 degrees nose-left, this coincided with the setting of the rudder trim tab indicator in the cockpit. Both right and left elevator trim tabs were set one and one-half degrees nose-up. The aircraft carried both wing and propeller deicing equipment. Because of the extreme damage to the cockpit, it could not be determined whether these deicing systems were in operation at the time of the crash.

▪ Both wing fillets and all lower fuselage compartment doors were accounted for, and it was evident that these had not opened or become detached while the aircraft was in flight.

▪ The empennage was carefully examined and nothing was found to indicate that it had been struck by any object.

▪ Although the cockpit section of the aircraft was destroyed, three seat belts were found which were identified as belonging to the seats of the three flight crew members; these belts were broken, indicating that the seats were occupied at the time of the crash. The two seats which were located in the extreme rear of the main cabin on the right side and normally assigned to the stewardesses, were found still in place but with their seat belts broken, indicating that these seats were also occupied at the time of the crash. Several buckled passenger seat belts which were partially burned were also recovered.

▪ All the components of the landing gear system were examined and it was determined that both the main and nose landing gears were in the retracted position at impact. The flaps were extended 15 degrees.

▪ All CO_2 bottles were found unused. A few of the cockpit instruments, although badly damaged, were readable. The indicators of the fuel flow gauges read: 690 lb.—No. 1 engine; 600 lb.—No. 2 engine; 190 lb.—No. 3 engine; and 120 lb.—No. 4 engine. The barometric scales of the pilot's and co-pilot's altimeters indicated 30.10 in.

ATA Honors Land

Vice Adm. Emory S. Land (left) who resigned as president of the Air Transport Assn. effective Dec. 31, receives a framed scroll commemorating his eight years with the organization from J. H. Carmichael, Capital Airlines' president (right) as new ATA president Earl Dollem Johnson watches.

Hg. The horizon bar on a gyro-horizon indicated an extreme right wing "down" position. A turn and bank indicator with the turn pointer missing had the steel ball jammed in the extreme right position. The nose heater with its sides crushed had a half inch hole punctured in the center of the rear end of the combustion chamber. Both cabin heaters were damaged. Disassembly and inspection of these heaters revealed no evidence of external fire or that leakage from their combustion chambers had occurred during flight.

■ Each of the four propellers separated from the engines and was found on the ground in the following sequence from the beginning of the wreckage distribution path: No. 4 first, followed by Nos. 3, 2 and 1. The blades of all four propellers were badly bent or twisted. Propeller domes were removed and inspection showed that at the time of impact the pitch positions of the blades were in the cruising range and the settings were consistent.

■ All four engines were recovered. Nos. 2 and 3 engines were complete, Nos. 1 and 4 engines were found with accessory sections separated from the power sections. A tear-down inspection of all engines showed no evidence of any malfunction or structural failure having occurred prior to impact. All engines were delivering power when the accident occurred. The fuel selector valves and the cross-feed valves were found positioned as follows: No. 1 fuel selector valve—No. 1 main to No. 1 engine, No. 2 fuel selector valve—No. 2 main to No. 2 engine, No. 3 fuel selector valve—No. 3 auxiliary to No. 3 engine, No. 4 fuel selector valve—No. 2 auxiliary to No. 4 engine. The right hand cross-feed valve was "on", the left hand cross-feed valve was "off." Impact forces probably moved the Nos. 3 and 4 fuel selector valves because their valve yokes were turned in such a manner that the yoke pins were against the stops. The No. 4 fuel selector valve was frozen; No. 3 could be moved freely by hand, however, one yoke finger was broken off.

On the morning of May 20, 1953, a low pressure center was located in southeastern Montana and northeastern Wyoming. A cold front which was moving in an easterly direction extended from this low pressure center in a southwesterly direction across northeastern Arizona and the extreme southeastern portion of California. An occluded front which was lying off the coast of Oregon and Washington in the morning moved in a southeasterly direction and, at the time the accident occurred, was over the extreme northwest portion of California. Attendant to this synoptic condition, rain and snow showers were forecast in the frontal zone in Arizona with light to moderate rime ice between the 10,000 and 11,500 foot level east of the front and at the 4,500 to 6,000 foot levels west of the front. Light to moderate turbulence was expected over portions of the route involved and in the Oakland Bay area above an altitude of 5,000 feet. No severe weather of any type was forecast for the Oakland Bay area during the time the flight was expected to be there.

Eye witnesses of the accident stated that they estimated the cloud ceiling to be approximately 1,200 to 1,300 feet at the time of the accident, and that the aircraft was first observed beneath the overcast approximately one mile southwest of the scene. The aircraft was descending in a steep right wing low slipping attitude and it remained in this attitude until it contacted the ground. Wing lights were lighted, and all agreed that the engines appeared to be running normally and that they heard no unusual noises such as might be identified with a runaway propeller or backfiring. One witness, whose home is approximately 1 000 feet west-southwest of the point of impact, said that immediately following the explosion, which occurred when the aircraft struck the ground, numerous pieces of hard ice fell into his yard, the largest of which was rectangular in shape, approximately two inches thick, and bore evidence of having been attached to a surface on which were rivets. According to witnesses, the flight path of the aircraft during its descent was slightly to the east of this witness' house.

Several pilots known to be flying in the area shortly before and after the accident reported that they encountered only mild turbulence and light icing above the 5 000 foot level. One pilot, who was holding over Newark at 8,000 feet approximately 35 minutes after the accident occurred, reported encountering severe icing conditions and mild turbulence with ice approximately three inches in diameter accumulating on antenna masts. He said that the ice began to melt when the 4 500 foot level was reached in the descent.

Chief Pilot Rodgers was on board to conduct a routine route check. He had considerable flying experience and ability and was known by his associates to insist that all flight crews adhere strictly to the company's regulations and the principles of safety. For passenger comfort, Rodgers insisted that all descents be made at a rate of descent not greater than 400 feet per minute. Another company rule he insisted upon was that all fuel selector valves be put in the main tank to engine positions during all approaches for landings. It is not known where Capt. Rodgers was seated in the cockpit when this aircraft was making the approach to Oakland; however, judging from the way in which he had conducted such checks in the past he normally would be sitting in either the co-pilot's seat or on the jump seat between the pilots.

All CAA navigational ground facilities were operating in a normal manner at the time of the accident.

ANALYSIS

All position reports made by the flight between Roswell and the Newark fan marker can be considered routine, however, two of these reports may need some clarification. At 1744, the flight asked Fresno communications station to expedite the clearance that had been requested at 1730, the time the aircraft was over Fresno, its altitude at least 500 feet on top.

As 14 minutes had elapsed since the initial request for clearance, the use of the words "please expedite" is understandable. The distance from Fresno to the Los Banos fan marker (compulsory reporting point) is 60 statute miles. N 68942 was making good a ground speed of approximately 190 miles per hour. Thus it can be seen that in the 14 minutes subsequent to passing Fresno, the flight would have progressed about 44 miles, leaving only 16 miles or five minutes flying time before arrival over Los Banos. A clearance was necessary to cross Los Banos and Evergreen, the flight received and acknowledged the following clearance at 1747:

Scooter Ramp

Italian airport crew has mounted a loading ramp on scooter to simplify moving the stair about. Here, one man guides the operation while another drives the buggy.

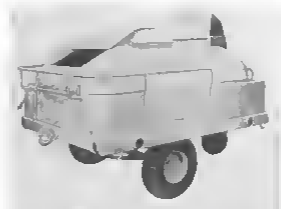
"ATC clears Douglas 942 to the Newark radio beacon, cross Los Banos at 8,000, maintain 8,000, contact Oakland approach control after Evergreen. No delay expected."

The flight reported over Los Banos at 1749 at 8,000 feet and estimated Evergreen at 1805. The time of arrival over Los Banos (1749) was only two minutes after the flight's receipt of the clearance to cross that check point. This time element, therefore, appears to be ample justification for the Captain's request that the clearance be expedited.

When over Evergreen (1810) the flight requested a change of altitude from 8,000 feet to 7,000 feet. No particular significance for this request was given by the crew, nor should any importance be attached thereto since it is customary for pilots to ask for changes in altitude for several reasons. However, since it was established that icing conditions probably existed at altitudes above 5,000 feet, Captain Hum may have requested a lower altitude for that reason. There still remained 21 statute miles or about nine minutes before arrival over Newark during which time the Captain may have thought that at 7,000 feet he might encounter less ice than at 8,000 feet to which he had been cleared.

The flight reported over the Newark facility at 1819 at 8,000 feet, ARTC having refused the request for 7,000 feet. It should be noted, however, that during the 11 minutes the flight was holding at 8,000 feet at the Newark compass locator, no radio contacts were made. This might indicate that the crew were not experiencing mechanical nor weather (icing) difficulties during that time, at least none was reported. From pilot reports and a study of the prevailing weather conditions, it is believed that any ice which may have accumulated on the aircraft's surfaces at the 8,000 foot level should have been melting at altitudes below 5,000 feet.

Approximately three minutes elapsed be-



Jet Starts Jets

Production models of MA-1 portable air generators, incorporating Palouste gas turbine, are being delivered to USAF by Continental Aviation & Engineering Corp., Detroit. The trailer-mounted compressor is used to start main engines of the North American F-100 and Convair F-102. The MA-1 uses Continental's Palouste gas turbine. Continental's Marbore jet engine will soon be in production as power for the XT-37 twin jet trainer which Cessna Aircraft Co. will build.

MANAGEMENT TEAM IN ACTION—Top executives of the Fairchild Engine and Airplane Corporation at Hagerstown, Maryland are shown discussing an engineering problem on the Fairchild C-119's or "Flying Boxcar"

tween the time the flight was cleared to descend and the message that it was leaving 8,000 feet. This is not an unusually long period of time for the crew to begin descent after receipt of descent clearance as it is not known at what point in the holding pattern the aircraft received permission to descend. This holding pattern is a one-minute right elliptical track to be made southeast of the Newark compass locator on the east side of the southeast course of the Oakland range. If the aircraft was headed toward the southeast when the clearance was received the captain may have, for reasons of his own, elected to complete his turn and head northwest toward the compass locator before he began his descent. Since the wind at 7,000 feet was reported as from 280 degrees at 55 miles per hour, this may have further reduced the ground speed on the approach to the locator and may possibly justify the three minutes involved.

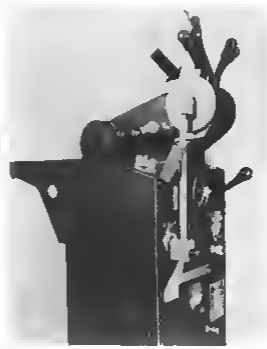
Once the descent was started, the flight reported leaving each 1,000 foot level until the final report stating that it was over the Newark compass locator at 3,500 feet inbound at 1836. None of these reports indicated that the flight was experiencing any difficulty nor did it declare an emergency at any time. The descent was made from 8,000 feet to 3,500 feet in six minutes at an approximate rate of 750 feet per minute. Although the descent to this level was made at a rate almost double that which Chief Pilot Rodgers instructed the company's pilots to use with passengers aboard, 750 feet per minute is well within safe limits. It is possible that because the crew was being checked, Pilot Rodgers purposely withheld criticism of their flying technique until the flight was completed.

All known facts indicate that the aircraft became uncontrollable almost immediately after the report leaving 3,500 feet was made. One, the accident occurred at a point about three miles inbound from the Newark compass locator and about two minutes after the last report was made, this necessitated an abnormal rate of descent of approximately 1,750 feet per minute. Two, witnesses agreed that the aircraft, when first seen beneath the clouds, was in a steep right wing low shipping attitude and that it remained in this attitude until striking the ground.

What caused the aircraft to become uncontrollable is not known. The possibility that aileron control may have become jammed was considered but is not supported by available evidence. The aileron trim tab control linkage is by means of cable between the cockpit control wheel and a point in the wing in front of the aileron trim tab. From that point back to the tab, the linkage is geared and rigid. Thus the finding of the right aileron trim tab in the neutral position after the accident indicates that it was so positioned immediately prior to the accident. The inconsistent position of the trim tab indicator could logically result from impact forces and progressive cable failure in the right wing sheared off.

The fact that ice fell to the ground adjacent to the scene of the accident, a large piece of which was identifiable by its contour as having previously been attached to an aircraft (most probably this one), indicates the probability that this aircraft had recently encountered a heavy icing condition. It is reasonable to assume that flying in weather where icing conditions were known to exist that the crew would have turned 'on' both pitot heaters. If these heaters were not turned 'on" or were malfunctioning, ice could accumulate at the orifices in the pitot heads and an erroneous indicated airspeed would result. If the static vents were similarly closed and the crew did not detect it and change to the alternate source, erroneous readings of the rate of climb indicators and altimeters might also occur. If such were the case, loss of control of the aircraft could easily result in a stall and with the prevailing low overcast, it is doubtful if there would have been sufficient time to regain control before striking the ground.

Another possible cause of the accident could have been the accumulation of ice on the surfaces of the aircraft in sufficient magnitude to have caused loss of control since the flight had flown for a considerable period of time above 5,000 feet in an area in which icing conditions prevailed. It is also apparent that the loss of control did not occur until after the pilot had made his routine report over the Newark fan marker at 3,500 feet. Had the aircraft been subjected to such a heavy icing condition, the ice could not have dissipated during the short period of time involved in making the descent despite the warmer temperature below 5,000 feet and the proper functioning



Lodestar Tab Control

New tab control wheel (arrow) for Lockheed Lodestars is placed at the pilot's fingertips next to the throttle, 14 inches higher than previously. It is expected this will eliminate groping for the control, perhaps at a critical moment. Old tab control crank may be left on, as in this picture, or removed, at owner's option. The new dural-and-steel unit has been devised and is manufactured by William Thorsen, and is marketed and installed by Aircraftsmen Inc., of Zahns Airport, Lindenhurst, L. I., N. Y. Installation of this CAA approved wheel control costs $275. One has already gone into Continental Can Co.'s Lodestar and Levitt Bros. is to have one put in their new craft.

of the aircraft's deicer equipment. It is true that the amount of an ice accretion varies greatly not only with altitude but also in relatively short distances and times, as does its rate of accretion.[a]

Since the examination of the wreckage did not disclose any malfunctioning of the aircraft or its components prior to impact, the foregoing possibilities are worthy of consideration. Although the Board cannot state definitely that aircraft ice probably caused this accident, it is true that if the crew did not appreciate the seriousness of ice accretion and take preventive measures at once, the performance of the aircraft could have rapidly been reduced to a dangerous degree relative to control and stall speeds. It is recognized, however, that several other circumstances might have been involved, the evidence of which could have been destroyed by the impact and fire.

FINDINGS

On the basis of all available evidence the Board finds that:

1. The aircraft, the carrier, and the crew were properly certificated.

2. The flight was routine until arrival over the Newark compass locator and fan marker.

3. The aircraft was flying under instrument weather conditions with icing in the clouds above 5,000 feet; temperatures were above freezing below this altitude.

4. The descent from 8,000 feet to 3,500 feet was made at a rate of approximately 750 feet per minute.

5. After reporting at an altitude of 3,500 feet and leaving the Newark fan marker inbound, the aircraft became uncontrollable and its average rate of descent was approximately 1,750 feet per minute.

6. Witnesses observed the aircraft when it was immediately below the 1,300 foot cloud ceiling in a right wing low slipping attitude and watched it continue in this attitude until it struck the ground.

7. No emergency was declared by the flight.

8. All ground navigational facilities were operating normally.

9. The location of the accident was approximately three miles beyond the Newark fan marker toward Oakland, and one and one-half miles to the right of course.

10. The available evidence does not indicate that any malfunctioning of the aircraft or controls, fire in flight, or structural failure occurred prior to impact.

PROBABLE CAUSE

The Board determines that the probable cause of this accident was the loss of control of the aircraft for reasons unknown, during its descent from the Newark compass locator.

By the Civil Aeronautics Board:

/s/ Oswald Ryan
/s/ Harmar D. Denny
/s/ Josh Lee
/s/ Joseph P. Adams
/s/ Chan Gurney

[a] The detrimental effect of ice formation on aircraft performance has been the subject of long research and numerous studies. The National Advisory Committee for Aeronautics has prepared several such reports; four highly informative ones are NACA Technical Notes Nos. 1538, 2542, 2812 and 1884.

Bankers Evaluate Aviation Record

Aircraft investment outlook good, IBA group finds, but high costs and low fares hurt air transport industry.

A significant investment survey continues to view the aircraft manufacturing industry in a favorable light while noting some apprehension in the airline earnings outlook. This is the substance of the annual report presented to the recent convention of the Investment Bankers Assn. by its Aviation Securities Committee.

The report of the committee under the chairmanship of Hugh Knowlton of Kuhn, Loeb & Co., reviews various elements influencing the position and outlook of the aviation groups.

Airlines

Analysis of the air transport industry's operating record brings the conclusion that although the group has shown a "tremendous and steady growth" in operating revenue and revenue passenger miles the operating net has shown no gain in terms of total dollars and has actually registered a substantial decline in unit terms as expressed in net operating income per revenue passenger mile and per available seat-mile.

The reasons for this unsatisfactory showing are attributed to the rising expense level and the downgrading of the price of the product sold (i.e., reductions in fares).

In the expense category, depreciation charges are reported to have greatly increased in dollar volume during the past year, due to the rapid buildup of larger and more expensive fleets. Also, the bankers' report says "there has been a tendency during the past year for the industry to shorten the depreciation period, thereby increasing the depreciation burden from 8.5% of operating revenue in the first half of 1952 to 9.7% in the first half of 1953."

▶ **Reduced Fares' Effect**—The trend of growth in reduced fare traffic is noted in some detail but is largely a restatement of the recent Air Transport Assn. study on the subject.

This noteworthy observation on coach travel is advanced by the IBA report:

"Prevailing industry opinion is to the effect that coach travel is more affected by adverse seasonal influences such as the traditional traffic slump in the fall and winter, than is first-class travel.

"If this vulnerability results in substantially reduced load factors for coach traffic the effect on earnings will be serious."

The investment committee's report notes that coach traffic does not necessarily represent a net gain even in volume, because a substantial portion of it has probably been achieved at the expense of a diversion from first-class traffic.

A summarized comparative earnings analysis for the bulk of the industry for the first six months of 1952 and 1953, presented in the IBA report, shows a striking increase in net income both before and after taxes in the first half of 1953. The report properly observes that the stated figures are distorted by two unfavorable events which influenced 1952 results: The oil strike, and temporary closing of Newark airport.

However, not stated in the bankers analysis and contributing far greater distortions in the published earnings for

both periods, are the non-recurring profits resulting from the sale of equipment. Such increments were substantial during 1952 and have also been of a major nature in 1953.

Aircraft Builders

The aircraft manufacturers are viewed in a far more optimistic light.

A summary of the results of 15 aircraft builders reveals significant gains for the first half of 1953 over the like 1952 period. For example, while sales gained from $2,091 million in the 1952 period to $3,191.3 million for the first half of 1953, or a gain of 53%, net income after taxes rose from $43 million to $74.2 million, a 72% increase.

The report notes that while the net profit margin after taxes is slight (2.3% in 1953) its impact on earnings per share is great because of the leverage of the tremendous sales on the relatively small capital structures of the aircraft manufacturing companies.

The survey asserts that: "Unlike the case of the airlines, there is no present sign of a falling off of profit margins. Actually the opposite is true."

▶ **Defense Dollars**—The committee report sums up a strong case for the aircraft industry this way:

"Surely there is nothing in the course of world events or in the political climate to indicate the slightest likelihood of our impairing the effectiveness of our defense preparations. There may be greater efficiency in the expenditure of defense dollars, there may be changes of emphasis in military planning, but it is inconceivable that any streamlining of military expenditures or change of military concept would be at the expense of the development of airpower.

"Naturally as we are now in the midst of an airpower expansion program the present buildup can not be expected to last indefinitely, and in a few years the industry may experience a leveling off if not a decline in volume. But even after allowing for this, we believe the aircraft manufacturing industry has become, instead of one of the most vulnerable industries, less subject to recession than most other industries and is almost guaranteed a high level of activity for many years."

This basis for the aircraft industry's optimistic outlook is very important and the IBA committee statement can contribute to improving the investment stature of the group. This fundamental change in the investment position of the aircraft industry has been repeatedly noted in this space. As sustained earnings of the aircraft builders continue to support and bolster this contention, the speculative investment ratings should give way to improving quality evaluations.

—Selig Altschul

Scheduled Lines Predict Peak Sales for '54

- **Carriers expect their 1953 safety record to help push passenger volume past last year's 31-million mark.**
- **ATA says the new low fatality rate shows the skeds' preoccupation with safe flying is paying off.**

By Lee Moore

Scheduled airlines are looking to their all-time safety record of 1953 to help make 1954 another peak year for sales. Carrier executives say the improving safety trend is a major factor in the ever-expanding public use of air travel.

In 1953, flying 31 million passengers more than 13 billion passenger miles, the airlines set a record of less than half of one fatality per 100 million passenger-miles. The 0.48 fatality index for 1953 is nearly twice as good as 1952, previous record year.

▶ **Safety Achievement**—Trends of airline passenger safety and volume generally have improved together since the start of air transport, and 1953 was tops for both.

Progress of airlines toward near-perfect performance is a joint effort of the air transport industry and the federal government.

Two leaders in these fields reviewed the 1953 record shortly before the closing days of their top responsibility.

- **Emory Land** retired as president of Air Transport Assn. Jan. 1 after more than 25 years' service (AVIATION WEEK Dec. 21, p. 15).
- **Oswald Ryan** last week was preparing to end his term as chairman of Civil Aeronautics Board but maintain his 16-year CAB membership (see p. 86).

Land stated: "Safety has always been a major consideration in the operation and maintenance divisions of the scheduled airlines of the U. S. It has been one of the factors I have always stressed since setting up and directing the first aeronautics safety conference held in this country (Daniel Guggenheim Fund for the Promotion of Aeronautics in October 1928).

"In the eight years that I have headed the ATA, safety has been my consuming interest. ATA's operations department is unflagging in its efforts to develop and perfect aids to safe all-weather flying. In this we have always had the complete cooperation of our member airlines.

"From the notable reduction in air fatality rates, it is evident that the scheduled airlines' preoccupation with safety is paying off."

Ryan did not make a statement, but he reviewed the 1953 statistics with safety investigation director William Andrews.

▶ **88 Out of 18,391,913,000 Mi.**—Basic safety statistics used by all transport industries are the number of fatalities and injuries per 100 million passenger-miles traveled.

ATA figured the 1953 record low fatality rate of 0.48 this way: U. S. scheduled airlines flew 18,391,913,000 passenger miles with 88 fatalities. Total passenger-miles reported by the association was 500 million lower than that listed by CAB (see box).

Breakdown of the number of passengers flown and passenger miles for the year:

- **Domestic trunklines** carried 26,248,073 passengers 14,366,042,000 mi.
- **Local service carriers** flew 397,657,000 passengers 2,022,963 mi.
- **Territorial airlines** flew 674,754 passengers 82,596,000 mi.
- **International U. S.-flag lines** carried 2,631,077 passengers 3,545,618,000 mi.

MATS Traffic Total Tops 500,000

Military Air Transport Service carried more than 500,000 passengers and patients during 1953, without a single fatality, Lt. Gen. Joseph Smith, MATS commander, says.

Since the outbreak of the Korean war in mid-1950, MATS has airlifted 66,000 sick and wounded from the Far East to the U. S. for medical treatment.

The Pacific Division transported 227,000 passengers and patients and 34,750 tons of cargo and mail during the year. The Atlantic Division flew 208,648 passengers and patients and 38,526 tons of cargo and mail. The Contoental Division carried 91,000 passengers and patients and 8,400 tons of cargo and mail in the U. S., Canada, Alaska, and Caribbean area.

MATS 1953 operations involved 115,000 mi. of global air routes to 38 countries, utilizing 100,000 Air Force, Navy and civilian personnel.

Scheduled Airline Safety Record

	Fatalities per 100 million passenger-miles	Passenger-miles flown (millions)
1938	5.2	614
1939	2.3	833
1940	2.8	1,262
1941	2.2	1,672
1942	3.2	1,742
1943	1.7	1,925
1944	2.6	2,534
1945	2.4	3,870
1946	1.6	7,199
1947	2.7	8,177
1948	1.3	8,208
1949	1.0	9,240
1950	1.3	10,702
1951	1.3	13,685
1952	0.9	16,173
1953	0.5	18,924

Source: Civil Aeronautics Board

Best Year

(Fatalities per 100 million passenger-miles)

	1953	1952
All scheduled airlines	0.5	0.9
Domestic	0.6	0.4
International	0.1	3.0

Source: Air Transport Assn.

Nonsked Safety

	Fatalities per 100 million passenger-miles	Passenger-miles flown (millions)
1948	19.7	458
1949	17.9	582
1950	3.8	770
1951	7.3	1,069
1952	2.1	1,252
1953	10.6	1,325

Source: Civil Aeronautics Board

Republican CAB Majority . . .

Chan Gurney

Oswald Ryan

Harmar Denny

Policy Lineup

- **Board's GOP majority keeps conservative rule.**
- **Chairmanship to rotate from Ryan to Gurney.**

Reappointment of Republican Harmar Denny to Civil Aeronautics Board and preparations to rotate the Board chairmanship from Oswald Ryan to Chan Gurney assure a conservative CAB policy on airline competition in 1954.

Chairman Ryan twice has urged annual rotation of the chairmanship among majority members. He told AVIATION WEEK he long has held this view but could not propose it until he was chairman.

▶**Recommended Change**—Ryan first proposed rotation after receiving President Eisenhower's confirmation of his 1953 chairmanship last April and again made the recommendation at a recent CAB White House conference. Rotation by seniority is proposed as the best way to provide a reservoir of experienced chairmen on the Board.

Because the White House works directly with CAB on international affairs, Ryan wants to restrict rotation of the chairmanship to members of the party in power.

The President has appointed Denny to a six-year term, assuring a GOP majority. Technically, it is an interim appointment until confirmation by the Senate. Eisenhower named Denny early last year to fill out the last nine months of a term vacated by the resignation of former chairman Donald Nyrop.

Present Democratic members, Josh Lee and Joseph Adams,

Board's Democratic Minority . . .

Josh Lee

Joseph Adams

▶**Majority Lineup Hardens**—Regardless of the chairmanship among the three Republican members the policy line of CAB on airline competition, routes and rate levels is expected to be consistently conservative in 1954.

The Board was split 2-2 last year before Denny joined as fifth member. Here is the lineup now:

• **Republican majority.** Denny held the balance of power and at first tended to vote a middle of the road policy, alternating between the new route and competition enthusiasms of Lee and Adams and the more conservative, protectionist policy of Ryan and Gurney.

As he studied and received advice on the issues during 1953, Denny moved toward the conservative camp on big issues. But he still maintains a middle-ground position on many problems.

On the recent question of mail exemptions for air cargo lines, he voted with Lee and Adams that such exemption was legal. But he crossed over to join Ryan and Gurney on the show-down vote, reasoning that such competitive mail service was not needed at this time (although Postmaster General Arthur Summerfield had said it would be desirable).

Ryan, an original 1938 appointee to the Board, has been a key member throughout most of its history, with a keen legal mind and long CAB experience. His primary concern is to prevent any backsliding in the trend of the major certificated airlines toward self-sufficiency and near-perfect safety in operations.

Ryan's chief policies are to maintain substantial profits, limited competition,

and broadening of airline markets through expansion of high-density air-coach services.

Gurney, former senator from South Dakota, consistently has voted about the same as Ryan. His general policies nearly parallel those of the Board chairman.

• **Democratic minority.** Lee and Adams favor a higher degree of competition than now exists on some of the major routes.

Republican members agree with them on some specific issues. But the split on basic policy is best illustrated by Lee's 57-page dissent last week to the majority vote against the Eastern-Braniff-Trans World application to give southern transcontinental service competitive with the American Airlines group (AVIATION WEEK Jan. 4, p. 67). Adams also dissented.

▶**Member Terms**—To preserve relative stability of CAB policy, the Civil Aeronautics Act provides six-year terms for CAB members, with only one expiring each year and none ending in the sixth year.

When a member resigns before his term is expired, the new appointee fills out the unexpired term and may be reappointed at its termination for a full term.

Present terms expire in this order: Ryan, Dec. 31, 1954; Lee, 1955; Adams, 1956; Gurney, 1958 and Denny, 1959.

ICAO to Improve Indian Ocean Facilities

Several amendments to improve air navigation facilities in the Indian Ocean area have been made to International Civil Aviation Organization's overall plan for increasing this region's commercial aviation capabilities.

ICAO recommends addition of upper-air observation stations, particularly in the Canary Islands and Tanganyika, East Africa, plus further development of the weather observation network to the Southern Indian Ocean.

Plans call for a complete changeover this year from presently used air-ground HF radio frequencies to new frequencies that will require simultaneous action on specified dates by all countries in the region and by airlines.

New navigation facilities planned include VOR, VHF direction finding, VHF markers, ILS and non-directional beacons. For some time to come, NDB will continue to be the principal en-route navigational aid, ICAO reports.

Delegates to a meeting at Santa Cruz de Tenerife, Canary Islands, recommend that research and development be carried out on producing a long-range navigational aid suitable for airline operations in equatorial regions under high noise conditions.

CAB ORDERS

(Dec. 28-Jan. 3)

GRANTED

Los Angeles Airways final mail pay of $1,021,198 for the period Apr. 11, 1952-Sept. 30, 1953, equal to $2.34 per revenue mile flown in scheduled service.

Transocean Airlines exemption to make a passenger flight from New York to Reykjavik, Iceland, under contract to Metcalf Hamilton Constructors. CAB says no certificated carrier bid for the job.

Trans-Canada Air Lines request to use Kinross Field, Mich., to serve Sault St. Marie, Ontario.

APPROVED

Revised through service equipment interchange contracts between Delta-C&S and TWA, Delta and American, and Delta, American and National.

SUSPENDED

Capital Airlines and **Northwest Orient Airlines** proposal to permit cut-rate family excursion fares on Saturdays. Delta, Eastern, TWA and United complained; CAB ordered an investigation of the merits of the proposal.

Pan American World Airways proposal to make refunds to Miami-San Juan passengers when coach planes are used on scheduled first-class flights. Eastern complained; CAB ordered an investigation.

DISMISSED

Wien Alaska Airlines request for exemption to serve Cape Lisburne, Alaska. Carrier withdrew its application.

Pan American World Airways investigation of proposed reduced charter rates to defense agencies on Boeing, Constellation and DC-6B types. PAA canceled the tariffs.

DENIED

Delta-C&S Air Lines request for special exemption to serve Ft. Wayne, Ind., as a temporary substitute for Anderson/Muncie/New Castle, Ind., pending installation of adequate airport facilities at the latter. CAB says this would require hearing and certificate amendment because of its competitive impact on Eastern Air Lines.

Transocean Air Lines request for exemption to fly all but three of 12 proposed Europe-New York flights slated by the Inter Governmental Committee for European Migration between Jan. 4 and Mar. 22. Certificated carriers TWA and Pan American offered to take up all or nearly all of the flights.

Riddle Airlines request for exemption to add Philadelphia to its New York-San Juan cargo route. National and Eastern filed protests.

TPA Studies Copter As DC-3 Replacement

Trans-Pacific Airlines is studying use of helicopters on some of its Hawaiian inter-island flights now served by DC-3s. The carrier's island runs are short, varying from 24 to 219 mi.

Noting that Sabena Belgian Air Lines has been using copters successfully on a limited commercial basis (AVIATION WEEK Dec. 7, p. 65), TPA president Ruddy F. Tongg says that while rotary wing aircraft do not offer immediate prospects to his airline "they do offer the greatest promise in the near future."

Tongg indicates he is thinking of 1958 and 1959 for inauguration of inter-island helicopter flight and possible copter taxi services directly to larger hotels.

JAL Coach Flights Win Heavy Bookings

Japan Air Lines—inaugurating trans-Pacific Douglas DC-6B service Feb. 3—reports its tourist flights between Hawaii and Japan are booked solid from Apr. 1 when the operation begins to Apr. 10.

The carrier will fly a DC-6B inaugural flight for the press Jan. 17, returning to the U. S. Jan. 28 after a tour of Japan.

Another JAL pre-inaugural flight will arrive from Japan Jan. 29, carrying prominent Japanese government officials and business men for a tour of major cities in this country.

For the inaugural flight and subsequent first-class service prior to Apr. 1, JAL will operate 38-seat DC-6Bs, then convert the planes to include tourist class.

The airline opened a Honolulu office Dec. 15 and is opening a Los Angeles office Jan. 19.

Venezuelan Airlines Win Miami Rights

Two Venezuelan airlines have received permission from Civil Aeronautics Board to use Miami International Airport as a scheduled stop, bringing the number of carriers who now are using this air terminal to more than 60.

Air France also is expected to begin using the field this month.

The new users, Linea Aeropostal Venezolana (LAV), government owned airline, and Rutas Aereas Nacionales S. A. (Ransa).

LAV also received operating permits for a Caracas-Montreal route by way of Havana and New York in addition to its Caracas-to-Miami flight which is routed by way of Curacao and Kingston.

Ransa has been granted co-terminals at Caracas, Maracaibo and Barcelona in Venezuela, with Curacao and Aruba, Dutch West Indies, and Kingston, Jamaica, as intermediate points. The airline operates six Curtiss C-46s on its international routes.

Feeder Airlines Call Mail Airlift a Success

Post Office Department and most local service airlines report their cut-rate Christmas mail airlift experiment a complete success, but some industry observers fear the low pay of 30 cents a ton-mile set a rash precedent.

The experimental rate was approved by Civil Aeronautics Board Dec. 15 and expires this week. It compared with regular local service priority airmail rates of 75 cents to $2.50 a ton-mile.

Post offices in virtually all of the 250 cities served by feederlines used the service during the Dec. 15-25 rush. Total volume is not tallied yet because most airlines did not start calculating their hillings until last week.

Proponents of the cut-rate experiment cite:

• **Community relations.** Post Office Department reports receiving many letters and wires from chambers of commerce and large business firms commending the expedited and efficient handling of holiday mail.

• **Government relations.** Washington officials of Post Office, CAB and other agencies were surprised at the speed and extent of P. O. regional supervisors' adoption of the local mail airlift authority.

"It showed the government what we can do," a top local service airline official told AVIATION WEEK.

• **Industry initiative.** The experiment was a project conceived and executed by the feeder airlines and engineered by Donald Nyrop, Washington representative of the Conference of Local Airlines.

Immediately upon getting word of the local airlines' 30-cent offer, Post Office Department notified its 15 general superintendents in the field to use their own discretion on decisions to dispatch mail via the service. They all used the service.

One observer believes Washington cut off the service Dec. 25 because local continuation of its use might outrun the allocated budget.

▶ **Criticism**—Despite general industry enthusiasm, one authority says he believes the local service lines prematurely maneuvered themselves into the same rate-cutting situation that Post Office has thrust upon the sturdier trunklines.

He says the 30-cent rate was much too low and opened the way for Post Office to attack local rates sooner than may have been planned originally.

A Post Office official comments: "All rates are going through the wringer."

Copter Fleet Grows

Expansion in helicopter charter service has made it necessary for Acrotecnica, Caracas, Venezuela, to add a fourth Bell copter to its fleet. The new aircraft is a Model 47G with skid-type landing gear and night flying equipment.

The firm is primarily engaged in survey, mapping and oil exploration for the government and private business firms.

Airmail History Is Commemorated

Plaque recently installed at Miami International Airport, Fla., commemorates the first airmail flight between North and South America flown by a Pan American World Airways Sikorsky S-38 on June 17, 1929. Presentation was made by the Historical Assn. of Southern Florida. Shown viewing the plaque (left to right): Edwin C. Drescher, PAA Latin American Division manager, Adam G. Adams, president of the historical group, Gen. Ralph Royce (USAF Ret.), member of the Greater Miami Aviation Assn. and I. D. Maclvar, chairman of the Dade County Commissioners.

First Comet Starts Destruction Tests

(McGraw Hill World News)

London—The world's first civil jet transport is being tested to destruction at the Royal Aircraft Establishment, Farnhorough.

It is one of the two Comet 1s originally purchased by the British Ministry of Supply from de Havilland Aircraft. No prototype this, it was bought for a "normal commercial price" in 1948 along with a sister ship.

Total cost to MoS for both Comets, $1.4 million. With a single-wheel undercarriage and various other fittings modified in Comet 1s now in service, the MOS craft did most of the original flight-testing for the entire jet transport series.

The Ministry backed the Comet 2 and is supporting Series 3 with prototype orders covering all development costs.

But the Comet 1 was, by any financial definition, actually a private venture.

▶ **Normal Fate**—Being tested to destruction at Farnhorough is the normal fate of most British military prototypes. Object is to determine ultimate load limits of various parts of the airframe.

The manufacturers ran these tests years before the Comet flew—testing wings to destruction and fuselage to "proof," in accordance with British Air Registration Board requirements.

But Farnborough has special tests of its own not necessarily related to civil requirements.

▶ **Crash Tests**—These tests possibly may throw some new light on the reasons for the crash of a British Overseas Airways Corp. Comet near Calcutta last May 2 (AVIATION WEEK May 11, p. 17), although the Ministry of Civil Aviation specifically denies that the trials have anything to do with this investigation.

Farnhorough has been investigating the wreckage of this crash for some months now. Object: determine the "sequence of failure" that led to the deaths of 37 passengers and six crewmen.

It is entirely possible that no report will be made public. The Indian court of inquiry into the crash cited "structural failure of the airframe in an unusually severe squall."

PAA Tourist Capacity To Increase 34%

Trans-Atlantic tourist capacity will be increased 34% by Pan American World Airways this year. The airline also will start complete round the-world low-fare flights costing approximately $1,100, compared with the $1,716.30 charge for first-class service, in April.

Last year, tourists accounted for 53% or 870,000 of the total 1,650,000 passengers flown by PAA. The total was 16% higher than 1952. In 1952, Pan American flew 544,000 tourist passengers or 38% of the total.

The airline reports that in one week in September 1953 it carried 4,106 passengers across the Atlantic, more than the total carried by the S. S. United States and the S. S. Queen Elizabeth during the same week.

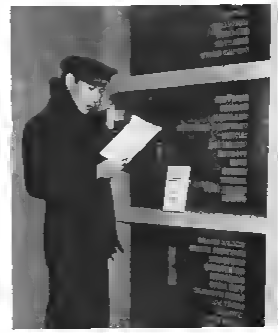
BOAC Passenger Traffic Increases 5%

Steady gains marked British Overseas Airways Corp.'s passenger traffic during 1953, increasing 5% to a total of 287,100.

Of the passengers flown, 76,205 traveled on trans-Atlantic services from London to New York and Montreal. In 1953, BOAC flew 9,460 tons of cargo including mail—counting 1,157 tons flown across the Atlantic—compared with a total of 9,379 tons carried in 1952.

Total revenue miles in last year came to 330,290,000, a 3% gain over the 1952 figure. Passenger-miles reached a total of 910,736,000.

BOAC's best week came in July, with 5,733 passengers, and a new record—23,140 passengers—was set for the month.



All-Night Contact

United Air Lines has installed this handy phone outside its ticket office in downtown Seattle to enable air travelers to obtain flight information or make reservations after office hours. Phone gives direct connection to the airline's reservation office. Note bracket containing UAL schedules fastened to window ledge. Listing of the cities which are served by the carrier is painted on the glass.

SHORTLINES

► **Frontier Air Lines** has started delivery of regular mail along a 10 city route in Colorado New Mexico and Arizona

► **International Air Transport Assn** predicts the world's scheduled airlines can look forward to a 10% increase in traffic during 1954 but says they cannot expect a fully equivalent rise in their revenues

► **International Civil Aviation Organization** has invited 20 European nations to participate in a conference on the coordination of air transport Apr 21, 1954 at Strasbourg, France

► **Nationalist China** has become the 62nd member nation of the International Civil Aviation Organization The republic withdrew its membership May 31, 1951

► **North Central Airlines** has applied to the Civil Aeronautics Board for permission to suspend service immediately over its local service routes between Minneapolis St Paul and Fargo, N D, and between the Twin Cities and Grand Forks, N D Company carried 3,337 lb of first class and other surface mail the first day of operation mail lift" designed to speed holiday mail

► **Northwest Orient Airlines** established a record year's passenger traffic volume during 1953 of 1.1 million compared with 937,900 in 1952 NWA flew 2,144,089 revenue miles during November a 13% increase over the 1,887,403 flown in November 1952

► **Pan American World Airways** is inaugurating Douglas DC 6B service on its Seattle Alaska route Jan 24, reducing travel time approximately 25% on flights to Ketchikan Juneau and Fairbanks The airline simultaneously is making cuts of from $2 to $10 in one-way fares

► **Trans World Airlines** is offering a new booklet entitled "TWA Skyliner Tours of Europe 1954" for prospective European travelers

► **United Air Lines** reports the greatest volume of air travel during the Christmas holidays in its history From Dec 23 through Dec 27, the airline flew 32,510,000 revenue passenger miles, a 22% higher than the corresponding period of 1952 UAL reached an all time high in volume of air cargo carried in a single day Dec 17, when the company flew 300,993 ton miles of revenue cargo United has organized an operations executive committee that will be responsible for operations policy and planning on its 13,250 mi system

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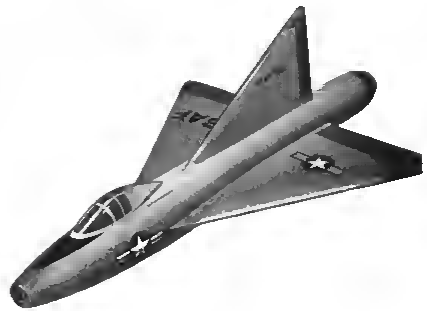

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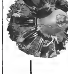

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Description	Mfg.	Part No.	Quan.
Heater	Surface Combustion Co	81A9	6
Heater	Stewart Warner (200,000 BTU)	9210	236
Blower	Dynamic Air Engine	4500 AA-6C	79
Blower	Joy Manufacturing Co	U 702 15	24
Tank Unit	Minn Honeywell	G-1099D	17
Trim Tab Controller	Pioneer	#15721 R	28
Oil Cooler Assembly	U.A.P.	U8416-MM	19
Oil Cooler Assembly	U.A.P.	U8013-MM	14
Hydraulic Pump	Vickers	MF9-713-15H	198
Hydraulic Pump	Vickers	PF12-713-15RCE	124
Hydraulic Pump	Vickers	PF4-713-20RCE	387
Hydraulic Pump/3000 P S I	Vickers	MF45 3911-20Z	43
Hydraulic Cylinder	Air Associates	HC2108	29
Hydraulic Cylinder	Air Associates	HC2110	8
Fire Detector	Edison	117 47	46
Fire Detector	CO₂ Mfg. Co.	ASDC2	85
CO₂ Cylinders	Kidde	981280	185
CO₂ Cylinders	Kidde	M6700368	47
Anti-Icer Pump	Adel	D7818	125
Auxiliary Power Unit	Eclipse	HEP-2	29
Auxiliary Power Unit	Lawrence	LER 30D	18
Pump	Pesco	1EAR 2808H	15
Pump	Pesco	1E-621	8
Pump	Pesco	2E258SA	21
Separator	Pesco	3V 217 HC	32
Accumulator	Vickers	AA14002A	35
Actuator	Air Associates	M 2031	22
Wobble Pump (D-3)	Erie Meter	AN4814	17
Oxygen Cyl	Kidde	923742	74
Windshield Wiper Kit	Marquette	K14949E	140

ENGINE ACCESSORIES

Description	Mfg.	Part No.	Quan.
Starter	Eclipse	1416-12E	75
Generator	Eclipse (NEA-3A)	716-3A	109
Starter Motor	Jack & Heinz	JH250-R	90
Generator	G.E.	2CM48A2	4
Generator	Eclipse	1003-4	71
Carburetor	Stromberg	PD12K10	559
Carburetor	Stromberg	PR48 A1	936
Carburetor	Holley	1685-HAR	90
Carburetor	Holley	1375-F	12
Magneto	Scintilla	SF9-LH-2	407
Fuel Pump	Pesco	2P249EB	6
Fuel Strainer	U.A.P.	U535A	76
Governor	Woodward	5x18	16
Prop Reversing Control	Ham Standard	72400	20
Oil Separator	Eclipse	564-2A	384
Oil Filter	Purolator	27314	100
Pressure Relief Valve	Aerotec	V301E7	20
Tachometer	Eclipse	2227 11-D3A	11
Vacuum Pump	Eclipse	610 2C	6
Spark Plugs	Auto	L54-AD1	185 000

AIRCRAFT ENGINES & PARTS

Description	Mfg.	Part No.	Quan.
Engine	Wright	R 1820-52	1
Engine	Wright	R 1820-54	16
Engine	Wright	R 1820-60	4
Engine	P & W	R-1830-43	1
Bearing	P & W	1045A	166
Flange	P & W	3500	500
Follower Assy	P & W	8818	130
Blower Assy	P & W	3ME14	814
Shaft	P & W	48362	53
Shaft	P & W	48363	75
Gear	P & W	48461	800
Gear	P & W	76236	72
Bearing	P & W	84289	7178
Housing	P & W	84487	113
Nose Housing	P & W	84591C	77
Crankcase Assy.	P & W	84350-D	200
Pump Assy	Wright Aero	420313	33
Drive Assy	Wright Aero	416491	46
Q E C Unit		FM1	38

AIRCRAFT ENGINES & PARTS (Cont.)

Description	Mfg.	Part No.	Quan.
Q E C. Unit		FY4M(B24)	17
Bearing	Timken	NR6L12	25700
Bearing	Fafnir	AN200-K3L2	18273

GAUGES

Description	Mfg.	Part No.	Quan.
Compass	Eclipse	26001-0	20
Gyro Indicator	Eclipse	14601-1BB1	11
Gyro Indicator	Eclipse	10078 1AG	62
Position Indicator Wheel & Flap	Weston	AH5780 2	400
Position Indicator, Wheel & Flap	G.E.	AH5780-2	1000
Position Indicator Wheel & Flap	Eclipse	20100-11C-4-A1	23
Pitch Trim Gauge	Eclipse	15100-1B-A7	19
Cowl Flap Indicator	G.E.	8DJ22AAY	21
Oil Temp Indicator	Lewis	77C3	23
Oil Temp Indicator	Lewis	77C4	13
Oil Temp Indicator	Weston	828TY13Z2	71
Manifold Pressure Gauge	Marsh & Maxwell & Moore	AN5770-2	28
Manifold Pressure Gauge	U S Gauge (Metric)	AW2 3/4-25K	140
Fuel Quantity Gauge	Eclipse	3801 38	108
Dual Carb Temp Gauge	Weston	828TY12Z2	40
Carb Air Temp	Lewis	77C3	52
Carb Air Temp	Weston	119862	49
Air Temp Gauge	Weston	727TY70Z2	11
Air Temp Gauge	Weston	727TY72Z2	85
Air Temp Gauge	Weston	727TY73Z2	88
Air Temp Gauge	Weston	727TY74Z2	63
Air Temp Gauge	Weston	728 40Z2	10
Air Temp Gauge	Weston	727 TY37P	298
Air Temp Gauge	Lewis	47822	33
Air Temp Gauge	Lewis	47823	88
Air Temp Gauge	Lewis	47824	54
Air Temp Gauge	Lewis	47821	30
Cylinder Head Temp	Lewis	76812	8
Torque Indicator	Eclipse	20100 49B-14A2	2
Tachometer Indicator	G.E.	8DJ13ABK	6
Tachometer Indicator	Eclipse	2222 1F 2A	200
Magnesyn Pos. Indicator	Eclipse	20000 2A-14	2
Magnesyn Transmitter	Eclipse	20000-43A 13A1	8
Magnesyn Indicator	Eclipse	13000-2A	67
Pressure Transmitter	Eclipse	22101 11-A4	15
Pressure Transmitter	Giannini	47114-D2 0-20	8
Differential Pressure Gauge	Kollsman	906-6-011	22
Differential Pressure Gauge	Kollsman	2548K-6-052	48

AIRCRAFT (RADIO)

Description	Mfg.	Part No.	Quan.
Transmitter	Bendix Radio	TA 12B	20
Receiver	Bendix Radio	RA10-DB	35
Amplifier (PB10) W/EDs Mount	Eclipse	15491-1	10
Amplifier	Eclipse	12086-1C	11
Radio Noise Filter	G.E.	1C-200	740
Radio Noise Filter	G.E.	NF10084	959
Tube		JAN6AL5	327
Standing Wave Ind	Hewlett Packard	415A	3
Antenna Switch	Bendix Radio	MS49A	20
Control	Bendix Radio	3610	21
Station Box	Bendix Radio	3620	23
Insulator	Bendix Radio	MT49C	518

ELECTRICAL PARTS

Description	Mfg.	Part No.	Quan.
Transformer	Eclipse	DW33	11
Transformer	Eclipse	DW18	80
Transformer	Eclipse	DW47	33
Transformer	G E	70G3	26
Servo Motor	Transicoil	#1300-20	57
Motor	G.E.	5BA40NJ1A	425
Motor	G.E.	5DP65 M81	182
Motor	G.E.	5BA25D J48	44
Motor	Airesearch	26675	25
Motor	Diehl	FD65 5	21
Circuit Breaker	Spencer	PM15	2094

ELECTRICAL PARTS (Cont.)

Description	Mfg.	Part No.	Quan.
Circuit Breaker	Spencer	Co363 1-5A	115
Circuit Breaker	Spencer	Co363 1-2A	115
Circuit Breaker	Heinemann	AM1614-80	1700
Circuit Breaker	Cutler Hammer	6141 H69A	237
Amplidyne	G.E.	5AM31JJ9A	31
Amplidyne	G.E.	5AM31NJ10	111
Switch	Kidde	A 4614	151
Ignition Switch	Scintilla	AN3213-1	78
Ignition Switch	Nesco	A (K94-3226)	250
Motor Switch	Jos Pollack	M802A	66
Thermo Switch	Fenwall	17322 2	110
Heater Control Switch	White-Rodgers	1033 4E1	287
Air Ram Switch	Minn Honeywell	PG208AS1	140
Air Ram Switch	Minn Honeywell	PG208AS7	40
Pressure Switch	Aerotec	M-101 B	90
Pressure Switch	Eclipse	3135 11C	88
Impact Switch	Kidde	SA/3A	18
Switch	C H	8909-K92	2000
Dome Light	Grimes	AN3096-4	2585
Dome Light	Grimes	AN3096-5	775
Dome Light	Grimes	AN3096-6	1365
Plug	Cannon	NAF310310-48	2747
Plug	Cannon	NAF310310-58	402
Relay	Leach	7264 484	47
Relay	Leach	7210	24
Relay	Allied	BOBX 2	21
Relay	Square D	82A	778
Relay	G.E.	CR2721 G100-K4	801
Relay	G.E.	CR2791F101 A3	616
Relay	Guardian	G34464	41
Relay	Guardian	G31502 A	388
Relay	C P Clare	D2080	45
Control Box	Vapor Car Heating Co	98048	34
Compensator	Vapor Car Heating Co.	46831T	25
Solenoid	Interstate Aircraft & Eng Co	A812	202
Flex Cable	Airesearch	25432	66
Temp Control	Fulton Syphon	715E	52
Noise Filter	Mallory	NF3 5	500
Regulator	G.E.	3GBD1A18A	13

VALVES

Description	Mfg.	Part No.	Quan.
Valve	Kidde	992585	328
Valve	Oh. Chem	AN60009-1B	325
Valve	Oh. Chem.	AN60009-2A	247
Valve (3000 PSI)	Parker	2-1046-76	47
Restrictor Valve	Parker	SP4 2746-7T	68
Restrictor Valve	Parker	SP4 2746-78	105
Restrictor Valve	Parker	SP4 2746-72	48
Restrictor Valve	Parker	SP4-2746-80	48
Restrictor Valve	Parker	SP4 2746-81	60
Restrictor Valve	Parker	SP4-2746-76	142
Restrictor Valve	Adel	18724	33
Cone Check Valve	Parker	PL2 2546-75	127
Cone Check Valve	Parker	PL2 2546-76	123
Cone Check Valve	Parker	PL2 2546-77	620
Cone Check Valve	Parker	PL2 2546-78	540
Check Valve	Parker	PLY-843-54	119
Check Valve	Parker	PL2 1846-77	23
Check Valve	Kenyon	12100-2-1018	87
Check Valve	Eclipse	557-5	9
Check Valve	U S Gauge	AW-CV 1 1	180
Valve	Parker	6-746-10	68
Valve	Vickers	AA31400	28
Restrictor Valve	Adel	18724	33
Lock Valve	Adel	12924-2	85
Brake Valve	Vickers	148102	22
Selector Valve	Parker	SP 1 445-8	7
Selector Valve	Adel	D9530	478
Selector Valve	Adel	D9530-2	808
Selector Valve	Adel	D9560 2	428
Selector Valve	Adel	D9632	179
Selector Valve	Adel	D9696	237
Selector Valve	Adel	D10844	744
Selector Valve	Adel	D10051	244
Solenoid Valve	United	37D6210 (AN4078-1)	1200
Magnetic Valve	General Control	AV1B1174	114
Throttling Valve		73 A 01	1865
Relief Valve	Airex	1255 900	240
Pressure Relief Valve	Aerotec	V30187	20
Valve	Aero Supply	74247 (TyPH3)	814
Valve	Whittaker	AN5930-1	335
Valve	Whittaker	AH5230-6	74
Valve	Parker	AH5231-1	60
Valve	Eclipse	612-4A	130
Valve	Kohler	K1 593-6D	1888
Valve (0-500PSI)	Bendix	148102	48

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Strictly Personal

Stories distributed to Scripps-Howard papers gave CCA a **cruel, unfair black eye.** They charged that the B-36 that hit a hill near El Paso was on CCA when it hit, that GCA operators were inexperienced teen-agers who gave inaccurate directions, etc. USAF investigations show the pilot had dismissed CCA, saying he was going downstairs for a look. There was one operator, not several, and he was experienced—not a "teen-ager." Most other "facts" in the stories were incorrect. . . . United Aircraft's **"Deac" Lyman** achieved clever publicity for U.S. aviation with a letter to the editor of the N. Y. Times, which was published, pointing out with pride that Britain chose an American-built plane, the Boeing Stratocruiser, to carry its queen overseas. The bait brought two more letters on the subject, from pro-British writers, including our old friend **Chris Clarkson.** Net result obviously was that the British don't have a suitable plane for the purpose—the Brabazon is no more, the Princess isn't ready, and the Viscount and Comet don't have enough range! . . . **Hi Sheridan,** the well-known airline pilot and humorist-writer, is seriously ill at National Institute of Health, Bethesda, Md. He'd welcome mail from his fans. He writes that doctors object to self-medication for their patients because it isn't feasible. . . . **Rex Smith,** PR chief of American Airlines, is readying a surprise announcement that will demonstrate the DC-7's speed as nothing else has. The secret test already has been made successfully. Rex had a pair of rabbits put aboard an American 7 at Los Angeles. Upon arrival in New York, the 7's crate still contained only two rabbits. . . . CAA Washington headquarters might do some checking to see if any employes passed over in the recent reduction in force because of "veterans preference" really have vet standing. . . . We salute **Lt. Cmdr. Arthur Schoeni,** USNR, for completion of a fine job over 10 years with Naval Aviation News—as its chief editor since 1946. He has joined Chance Vought. . . . We like **Fairchild's** succinct statement in its ads, "Freight takes a boxcar, not a Pullman." . . . Eastern helicopter manufacturers are disturbed at CAA's plan to transfer **Herbert Toomey,** chief of the First Region's aircraft engineering branch, into flight test. More than half of the work of Toomey's branch involves new helicopters. He is an experienced copter pilot and engineer. His probable successor isn't, but is "bumping" Toomey, which brings about dislocation of several other technical men. While technicians like Toomey are being reduced in grade, some men in **Al Koch's** old International Division are being promoted, industry people say. . . . Incomplete report published elsewhere prompts us to give you the facts about year-end advertising figures in aviation magazines. They show AVIATION WEEK surging upward to record publishing levels. AW carried 3,440.29 ad pages. This established a new level for the aviation publishing field. As a comparison, American Aviation lagged behind with 1,088.95 pages. Aero Digest published 897.20 pages for 1953 and Aviation Age 1,687.69 pages. In terms of advertising dollar revenue AW rolled up over $1.75 million, with total income edging near the $2-million mark, all-time record in the field. . . . One of our friends who has studied air safety hopes the company that brings out the tailor-made **executive aircraft** will think of crash survival for the occupants before it draws the first line in the design drawings. "These business planes carry a lot of high-priced people," he said. "If the plane owners are willing to spend $25,000 or more for a plush interior they should be willing to spend another few thousand to improve their own chances of crash survival, perhaps even at the expense of five miles an hour." He mentioned a few current practices of business plane operators that can be lethal under some conditions—swivel chairs that are good for maybe only 5 or 6 Gs, loose typewriters and vases, etc., that could be flying weapons on impact. Maybe he's got some points worth thinking about. . . . The editor of AVIATION WEEK was to speak before the Management Club of Lockheed Aircraft Service, International, at Idlewild late last week. Robert Hotz, executive editor, spoke before Detroit Adcrafters Club recently. David Anderton, Engineering Editor of AW, addressed the Men's Club of Mahwah, N. J.

—RHW

AVIATION CALENDAR

Jan. 11-15—Society of Automotive Engineers, annual meeting, Sheraton-Cadillac and Statler Hotels, Detroit. American Helicopter Society will present a familiarization program and a symposium on copter fatigue problems Jan. 14.

Jan. 18-22—American Institute of Electrical Engineers, winter general meeting, Hotel Statler, New York.

Jan. 20-22—Operations Research in Production and Inventory Control, Case Institute of Technology, Cleveland.

Jan. 25-28—Plant Maintenance & Engineering Show, International Amphitheater, Chicago. Conference will be held concurrently at the Hotel Conrad Hilton.

Jan. 25-29—Institute of the Aeronautical Sciences, 22nd annual meeting, Hotel Astor, New York. Honors Night Dinner, Jan. 25. American Helicopter Society will present papers on transport and military copter design Jan. 25.

Feb. 1-5—American Society for Testing Materials, 1954 Committee Week with symposium on color of transparent media and design of experiments, Shoreham Hotel, Washington.

Feb. 3-5—Society of Plastics Industry, ninth annual division conference on reinforced plastics, Edgewater Beach Hotel, Chicago.

Feb. 4—Instrument Society of America, ninth annual regional conference, Hotel Statler, New York.

Feb. 4-6—Institute of Radio Engineers, sixth Southwestern Conference and Electronics Show, Hotel Tulsa, Tulsa, Okla.

Feb. 11-12—Montana Aviation Trades Assn., convention, Bozeman.

Feb. 15—American Society of Testing Materials, Southwest district joint meeting with National Association of Corrosion Engineers, Dallas.

Feb. 18-19—Institute of Radio Engineers and American Institute of Electrical Engineers, transistor circuits conference, Philadelphia.

Feb. 21-23—Third annual Texas Agricultural Aviation Conference, Texas A&M College, College Station, Tex.

Mar. 22-25—Institute of Radio Engineers, national convention, Waldorf Astoria Hotel and Kingsbridge Armory, New York.

Apr. 5-8—American Management Assn., 23rd National Packaging Exposition, Convention Hall, Atlantic City, N. J.

Apr. 14-16—Society for Experimental Stress Analysis spring meeting, Netherlands Plaza Hotel, Cincinnati.

Apr. 19-20—Symposium on automatic production of electronic equipment, sponsored jointly by Standard Research Institute and USAF, Fairmont Hotel, San Francisco.

Apr. 21-24—Second annual student paper competition for undergraduates and graduates, sponsored by the Texas section of IAS, Melrose Hotel, Dallas.

Apr. 22-23—American Institute of Electrical Engineers, conference on feedback control, Claridge Hotel, Atlantic City, N. J.

May 4-6—1954 Electronic Components Symposium, Department of Interior auditorium, Washington, D. C.

May 5-7—Third International Aviation Trade Show, managed by Aircraft Trade Shows, Inc., 71st Regiment Armory, New York.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—JANUARY 11, 1954

EDITORIAL

Don't Depreciate People!

Never underestimate your fellow man! There is food for thought along these lines in a pungent editorial written by Joseph M. Chase in a National Safety Council publication. We recommend it to aviation supervisors, foremen, executives and editors.

Mr. Chase is on the staff of the Flight Safety Foundation, but his editorial was written for the air transport section news letter of the Safety Council.

He maintains that most of us too often underestimate the intelligence of people. "We discount the ability of the average worker either to comprehend or retain instruction. We believe the only way to reach the man in the shop or the hangar or on the ramp is to make things funny paper sample.' We key our efforts for mass minds of sub-adult level, and then are disappointed if the results are only sub-standard."

Mr. Chase's research indicates the origin of a fallacy, publicized so well the past 30 years. During the first World War intelligence tests were given 100,000 Army recruits. Results indicated an average mental age of 13 years. So everyone decided that the way to influence people was to appeal to them in terms of tastes and intellectual values of a 13 year-old child.

This 13-year old mentality myth was exploded some 10 years ago but the news has been slow getting around. Mentality is more than innate intelligence, it is also the accumulated lessons of life.

Psychologists contend that normal intelligence itself probably ceases to develop somewhere between the ages of 14 and 16, but that acquisition of knowledge and experience continues throughout one's lifetime.

"There is a persistent tendency to talk down to people, write down to them as though they really were children with limited understanding, a minimum of responsibility, a congenital distaste for reality," Mr. Chase says. This explains, he believes, a lot of mediocre success. "It also indicates a sad waste of intelligence that could be utilized to better our safety performance. If any of us still subscribe to the 13 year old mentality myth, it is time we moved up into the present."

The same advice applies to the airlines, we believe, and all others who deal with the public. Never underestimate your fellow man!

Costly Bureaucracy

In a smart publicity move, the railroads have come out of a huddle to announce that bogged down federal bureaucracy has cost them at least a billion dollars in potential revenues lost in the postwar period because of delays by the Interstate Commerce Commission in approving desperately needed rate adjustments.

Wonder if the Air Transport Assn. will estimate what interminable procrastination at Civil Aeronautics Board in the last five years has cost them? One index might be the individual airline financial reports and the compensation paid to law firms as legal fees. Some of these figures are astronomical.

Albert Plesman

Commercial air transportation lost one of its great leaders with the death of Albert Plesman at The Hague on Dec. 31.

The founder and president-director of KLM, Royal Dutch Airlines, was an aviation pioneer who worked tirelessly to advance his airline and the industry. He brought KLM to the top among the world's airlines, in efficiency as well as in size, and then saw it disintegrate overnight when the Germans invaded the Low Countries and seized or destroyed most of its modern fleet. Mr. Plesman was imprisoned for a year, and later was kept under house arrest.

"He spent the war years planning the reconstruction and reorganization of his beloved KLM," his company recounts in an announcement of his death, "and in 1945 traveled to the United States to obtain surplus aircraft in order to reestablish his company. One year later, with 14 American aircraft trans-Atlantic service was in operation and the pre-war network of air routes was almost completely restored."

The company has grown constantly, now has more than 13,000 employes, and flies 130,000 route miles, using 81 aircraft—all built in the United States—linking 102 cities in 66 countries.

He was one of the founders of the International Air Transport Assn., and was its president from 1949 to 1950. He was decorated by The Netherlands, Belgium, Czechoslovakia (before World War II), Sweden, Lebanon, Denmark and Greece.

Few men have done as much to advance commercial air transport—technically and economically—as Albert Plesman. He will be missed by all of us in aviation.

Tension in Korea

Prisoners and politics crowd military aviation developments out of newspaper correspondents' dispatches from Korea, but at the Fifth Air Force Headquarters in Korea military problems are of primary and increasing concern, writes AVIATION WEEK's Far East correspondent, Bill Jessup, who has just visited the post.

Despite what you read from day to day elsewhere, Jessup reports a new tenseness—you could call it the January jitters—grips combat commanders. On the one hand, Republic of Korea President Rhee claims he will unify Korea by any means he considers fit if a peace conference hasn't accomplished this miracle by Jan. 23.

On the other hand, the Communists could renew hostilities with or without the pretext of Rhee's "provocations."

In this day and age, airpower is the key element to warfare in Korea, and the Reds are in a far better position to launch a massive surprise air attack than heretofore.

That explains the tenseness and jitters. The Commies hold the initiative. That, perhaps, is why the highest officials of the U. S. government have been warning the Reds repeatedly that we will use all-out atomic weapons, if they take that initiative.

—Robert H. Wood

Longest nonstop Jet fighter flights

Colonel Dave Schilling's 31st Strategic Fighter Wing and the 508th Strategic Fighter Wing commanded by Colonel Cy Wilson have each set another American airpower record.

The 31st made their mass jet flight across the central Atlantic—4,470 miles over water from Turner Air Force Base in Georgia to Nouasseur, French Morocco.

The 508th flew 4,485 miles nonstop from Turner to Lakenheath, England – the longest transocean nonstop jet fighter flight ever made.

As in earlier record-breaking mass refueling flights, both wings flew Allison-powered Republic F-84G Thunderjets. The 508th was in the air 11 hours and 20 minutes; the 31st landed after 10 hours and 21 minutes.

Many Air Force men—crew chiefs, pilots, mechanics—helped write this U. S. jet fighter power record in the books. Their efforts, backed up by Allison's engineering, design and production skill, have scored another Allison power record in the air.

GM GENERAL MOTORS

Allison DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA

World's most experienced designer and builder of aircraft turbine engines—J35 and J71 Axial, J33 Centrifugal Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines